The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXXVIII. January 15, 1938 No. 968

The French Forty-Hour Week Experiment

WHEN the Socialists under M. Blum came into power in France, one of the first things they did was to put into effect the 40-hour working week. In principle, as we have pointed out in these columns before, there is considerable justification for the reduction of hours. It is in accord with the industrial history of the past century, and it is a logical answer to the achievement of science in enabling us to produce goods at a higher rate than we can use them. Not only has the machinery of production been speeded up, but the quality of the goods themselves has been improved. Obviously, if we can spend more time in leisure, and less in production we can restore the balance. In spite of this excellent reasoning, however, the French experiment does not seem to have been successful. The output has been falling steadily for nine months, so that the industrial position of the country is deteriorating, due to the fact that supply is falling behind demand, and producers can neither meet the demands of the foreign market, nor even the necessities of the home market. There are gathering signs that the experiment may have to be abandoned—it has already been modified. Undoubtedly, as will be seen later, the experiment was started under unfavourable circumstances, and in ignorance of the proper conditions. It was not surprising when events caused the French Government to set up a "Committee on Production" to investigate the whole business.

Wise as the 40-hour week is in theory, its wisdom in practice largely depends upon persuading the rest of the civilised world to follow suit, and in retaining a reasonable measure of freedom in regard to internal arrangements. This essential condition has been neglected, but under the conditions now ruling in many countries where the internal market is regarded as all-important, economic self-sufficiency is the rule, and imports are so small as to be almost non-existent, that neglect would not of itself give rise to disaster. Leaving the effect on exports out of account, the conditions which must precede any successful attempt to institute a 40-hour week are: (1) over-production; (2) unemployment in the trades most affected by over-production; and (3) an industry organised in large units, welcoming the change enthusiastically, and possessing plant, and industrial methods thoroughly up to date.

The French experiment appears to have had none of these advantages. It was started purely as a political move, with the advent to power of the Front Populaire, and as such was hailed with enthusiasm by members of that party, and as cordially hated and distrusted by members of other parties, who included most employers and capitalists. The initial outlook did not appear happy. Many of the employers have still some of the mentality towards the workers of the great lords of the more extravagant days of the French Court. Although France is not without her big combines and organised industrial units, no less than half the workmen are employed by small firms. It has been said that the ruin of the Great War has left France encumbered with obsolete equipment, which leads to high costs, and employs too many men per unit of output; the shorter hour was, therefore, not genuinely applicable. So far from being introduced when production was in advance of consumption, the change was made when the re-armament programme was to tax the resources of industry. Where, for example, should we be in this country if we imposed a shorter working week on our iron and steel industry? Costs have increased because a workman is paid as much for working 40 hours as he used to be for working 48 hours. The industrial conditions since the war have caused a dearth of skilled men. Industry cannot respond to demands for increased production unless both the skilled men and the plant for them to operate are available. With the coming of the 40-hour week, both were found wanting, and the re-armament programme prevented the deficiencies from being corrected. Obviously, the experiment was undertaken at almost the worst possible moment, and under exceedingly unfavourable conditions.

The Commission has now reported that a greater measure of flexibility is necessary. Supplementary hours are to be allowed in all industries subject to irregular activity. The 40-hour week is to be modified where industries are handicapped by a shortage of skilled labour. The law is to be suspended in undertakings working for the national defence. The Commission, however, denies that obsolete equipment is responsible for the difficulties and declares that French industry is adequately equipped. We have learnt from this experiment that the shorter working week should be applied gradually by industries, and not thoughtlessly to the whole of a country. It is not a matter for politics, but for economics. *Festina lente* must be the motto, and imposition by law is fraught with grave dangers.

We are beginning to understand the conditions under which working hours can be reduced, but we have yet to remove the greatest difficulty of all—the rise in costs which seems the inevitable concomitant of shorter working hours. International economics is a highly complicated subject in which experiments that fail are apt to be costly or even disastrous to the whole nation. International trading conditions are very different from those obtaining during the nineteenth century when the length of the working day was under drastic revision. Then we could take Britain as the unit, now we must take the world.

Notes and Comments

Working Conditions

VERY little study has been made in the past of the research chemists' comfort and the attractiveness of his working conditions. Owing to the very nature of his work, he was at first placed in any spare basement room or attic where he could do little material damage. Later, as the value of chemical research began to be recognised by industry, he was transferred to a room specially set aside, and provided with a certain amount of equipment, which went under the name of an organic chemistry laboratory. It was usually dirty, ill-ventilated, inadequately lighted, and generally badly constructed. After the war, a decided attempt was made to provide better facilities for the research worker. Large and expensive laboratories were built which were better than their predecessors in a number of respects, but fundamentally their design had not changed. The new research laboratories, built by the Dyestuffs Group of Imperial Chemical Industries, Ltd., at Blackley and opened on Tuesday, break away from the traditional design. From a description of the laboratories given on another page, it is evident that problems such as lighting, ventilation, and services have been closely investigated by the architect, chemist, builder and engineer working in co-operation. An important step forward has been taken in laboratory construction and a very great improvement has been effected in the chemist's comfort, convenience, and all-round working conditions.

Scientific Discovery's "Penalty"

OCCASIONALLY the scientist is bluntly charged with promoting and sustaining war by reason of his inventions, and just as often it is pointed out that the results of his discoveries are of infinite trouble to the world at large. In the presidential address to the annual meeting of the Science Masters' Association last week, Sir Cyril Ashford said that scientists and inventors had between them, by solving the problems which they had set themselves, presented the civilised world with problems as least as difficult as those which they had solved and for which the penalty for not finding a complete solution would be the destruction of European civilisation. The work of the pure scientist is solely concerned with contributions to technical knowledge; it is no concern of his how this knowledge is subsequently applied, but it cannot present such serious problems. What might be termed the commercial scientist investigates industrial processes and products from the economic aspect. He works upon a comparatively narrow field and his activities are the very reverse of menacing to civilisation. Scientists have played an essential part in building up our present state of civilisation. It can only be imperilled by a gross misuse of their implements by intentional destructors.

The Engineer Speaks

THE Engineering Public Relations Committee was formed last year in order to present to the public information concerning the science and practice of engineering and its services to the public. Fourteen institutions and bodies, including the Institution of Chemical Engineers, are represented on the committee and the preliminary programme of activities has been drawn up. In brief, the programme comprises lectures for schools and colleges, Christmas lectures for young people, exhibits in London and the provinces, Press information, co-operation with the B.B.C. and news-reel film companies, and co-operation with institutions and engineering societies outside London. The scheme of work is therefore divided into two main sections, one designed to inform the young of the function of engineering and what it has achieved, and the other to circulate to the general public items of engineering interest and news value. It is interesting to see that this large-scale scheme has been initiated by a profession as a whole for the enlightenment of the general public regarding its objects and accomplishments. This is a novel idea worthy of expansion. Propaganda for the chemist, objectionable as it might sound, would not be without value. For instance, the serious typhoid epidemic at Croydon has shown what disastrous effects can result from a public water undertaking operating without immediate chemical supervision at the works. As matters stand at the moment, it is left to the decision of the water company whether a chemist is employed or not and also how often, if at all, samples are submitted to the public analyst. There is no enactment forcing water companies to employ chemists and many do not do so. If the public can be made to realise, more fully than at present, what it owes in everyday life to the work of the chemist, such situations as this would not arise.

Unemployment Statistics

MUCH prominence has been given in the Press to the figures of employment and unemployment for last month. In common with all other indications of industrial prosperity at the present time, they have been subjected to close consideration. They show that there were 136,000 less employed persons than in November last, but about 200,000 more than a year ago. There were also about 166,000 more unemployed than the previous month. The increase in workless can be satisfactorily put down to seasonal variation and by the damage done to export trade by international disturbances as in China and Spain. As far as the chemical trade is concerned, the published statistics of employment cannot give a strong pointer to the health of the industry. In this case, seasonal variations are practically non-existent, and the proportion of unskilled labour employed is much smaller compared with other manufacturing trades, with the result that its unemployed account for a correspondingly small section of those drawing unemployment relief, who are represented by the official figures.

Fertility of the Soil

NOTWITHSTANDING the wide range of fertilisers, suitable for nearly every type of crop, which has been made available to the farmer within recent years, it is a depressing fact that the actual area of land under cultivation is continually falling off, while that under permanent grass, producing a loss in fertility, is showing a steady increase. A valuable contribution to the means for increasing soil fertility has been provided by the Government's lime and slag subsidy but, as Professor Stapledon pointed out at the Agricultural Conference of the Chartered Surveyors' Institution, there is a need for drastic revision of present agricultural methods if the full benefit of the subsidy is to be reaped. Professor Stapledon strongly advises that the 16 million acres of land at present under permanent grass should be completely broken up and a scheme of grass-arable rotation adopted. At the present time the advantages afforded to agriculture by the use of fertilisers are being wasted by the smaller area of land to which they are being applied.

Recent Advances in Pigments

Developments of Practical Interest—The Trend of Research in the Pigment Field

At a meeting of the Oil and Colour Chemists' Association, held in the rooms of the Federation of British Industries, on January 6, with Dr. G. F. New, president, in the chair, Dr. H. Samuels presented a paper on recent advances in pigments. He chose for discussion those developments of the last two or three years which seem to be of most practical interest, and those which serve to indicate the trend of thought and research in the pigment field.

Discovery of the Phthalocyanine Pigments

Dealing first with developments representing entirely new departures in the pigment industry, Dr. Samuels said that the most important was the discovery of the phthalocyanine pigments. The first phthalocyanine was observed in 1928 as an impurity of a blue colour formed during the manufacture of phthalimide on an industrial scale. It was isolated in a stable crystalline form and was found to be insoluble in the usual organic media and in water, dilute acids and alkalies. The blue compound was soon recognised as a valuable pigment, and the first information regarding it was disclosed in a patent covering the preparation of blue colouring matter by the reaction of phthalic anhydride and ammonia in the presence of a metal. That was followed by a further patent dealing with the preparation of similar coloured compounds by heating an *o*-cyanocarboxylic amide in the presence of a metal.

Great interest was immediately shown in the phthalocyanines, since they presented several novel features in structural chemistry. The molecular structure of the phthalocyanines was determined by Linstead and his co-workers, who showed that the molecule consisted of four iso-indole units joined together by means of the extracyclic nitrogen atoms. That structure had received confirmation through an X-ray study of the crystal structure of several members of the series by Robertson.

The first commercially available phthalocyanine, as typified by Monastral Fast Blue BS, was the copper derivative, blue in shade and possessing a range of desirable properties not hitherto associated with any one pigment, and which had permitted its use in practically every pigment-consuming industry. That was followed by the metal-free phthalocyanine, greener in shade than the copper derivative. Lead phthalocyanine was a green pigment prepared by heating phthalonitrile with metallic lead, litharge or lead carbonate, but did not possess the same outstanding fastness properties as the original copper derivative. Green pigments with similar properties were also prepared by chlorinating or brominating phthalocyanines.

Soluble Phthalocyanine Dyestuffs

The phthalocyanines were also capable of being sulphonated to give soluble dyestuffs which were commercially available and could be precipitated in the usual way on to suitable bases. The sulphonated phthalocyanines could also be precipitated by a patented process with organic bases to yield a spirit-soluble dyestuff. That also was available commercially.

One of the most recent developments was an investigation of the napthalocyanines by Linstead and Bradbrook. They had discussed the preparation of the ten possible dicyanonaphthalenes and had shown that only the 1 : 2 and 2 : 3 formed naphthalocyanines. The 1 : 2 dicyanonaphthalene, being the most readily available, had been studied in detail, and it had been shown that the green compounds derived from it were of the phthalocyanine type; the behaviour of its isomerides verified the statement made by Dent, Linstead and Lowe that the two nitrile groups taking part in phthalocyanine formation must be linked to adjacent carbon atoms of an aromatic nucleus.

Some interesting developments in regard to mixed crystal pigments had been reported. The so-called molybdate reds or scarlet chromes belonged to that class; they consisted of tetragonal mixed crystals of chromate, sulphate and molybdate of lead. The original patent covered also the presence of lead chromate and/or lead tungstate, and part of the lead might be replaced by barium and/or strontium. By varying the composition and manufacturing conditions it was possible to change the shade of molybdate red from orange red to scarlet. Those scarlet chromes were stronger, much redder and more brilliant in shade than the basic orange chromes, and although they were a little inferior in fastness to light, they were being widely applied in the paint and printing ink industries.

A further mixed crystal system had been described containing zinc oxide in the lattice construction and at least one oxide of a metal of the fourth group of the periodic system and at least one colouring oxide of a metal of the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel and uranium. A patent had also been taken out covering the manufacture of coloured pigments containing barium sulphate as the basic material by precipitating barium ions by sulphate ions in the presence of manganese or other heavy metals, mixing the precipitate with the nitrate and calcining.

Other such systems had been reported and there seemed little doubt that much more would be heard of that class of pigment.

Lead Cyanamide

Lead cyanamide was a new pigment recently proposed. It was light lemon yellow in shade and was claimed to be faster to light than a lead chrome lemon yellow. The oil absorption was about the same as for a similar shade chrome yellow, but it had a higher covering power and a lower drying time. It could be used in N/C lacquers and was said to possess good anti-corrosive properties. Two advantages claimed for lead cyanamide over red lead were smaller density and, therefore, less tendency to settle, and less liability to thicken. It was too early yet to make a final decision regarding the value of the pigment. A series of insoluble pigments consisting of metal phthalates had been described by Gardner and named by him " metallates."

A novel development in white pigments was the discovery of a white organic pigment consisting of halogenated aralkyl-aryl ethers, prepared by the reaction between polyhalogenated aralkyl halides and alkali metal salts of halogenated phenols. Those ethers were claimed to be very resistant to heat and hydrolysis, with dilute acids and alkalies, and had high refractive index (1.56 or greater), and for that reason they had high hiding and pigmenting properties. Those products did not appear to be commercially available yet.

In the pigment dyestuff and organic pigment field there had been few developments of fundamental importance, the patented inventions dealing principally with the preparation of new dyestuffs differing in detail, but not in principle, from those already known, their object being to secure some specialised technical effect or property. There had been two new developments, however. It was found that dyestuffs of the cyanine, carbocyanine and styryl series, containing an indolene nucleus, were particularly valuable as starting materials for the type of pigment involving precipitation of basic dyestuffs with complex inorganic acids. Those new pigments were claimed to possess exceptional brightness and to show superior fastness to spirit, oil and light compared with the analogously prepared lakes from tri-arylmethane dyestuffs. That improvement in light fastness was remarkable, in view of the fact that such dyestuffs in general were insufficiently permanent for use on textiles.

The other new development was the claim that after suitable treatment cuprous ferrocyanides of basic dyes could be made fast to light. The treatment consisted either of ageing the precipitated dyesalt for a long time at ordinary temperatures or for a shorter time at 70° C. in the presence of an organic acid.

Coming to matters which, while not entirely new departures, were additions to and amplifications of our knowledge of known pigments. Dr. Samuels discussed chrome yellows and said the application of the principle that was involved in using mixed crystals of chromate, sulphate and molybdate of lead in the production of scarlet chromes had made possible also the manufacture of an orange chrome which conformed to the Home Office test for soluble lead.

Novel Pulsation Process of Drying

Novel methods of drying aqueous pigment pastes had been investigated. A pulsation process had been described in which an air current was made to pulsate 20 to 100 times per minute over the pigment. It was claimed that a great saving of heat was effected and, because of the more uniform drying, less aggregation of the pigment particles occurred. The drying of pigment pastes by electro-osmosis had also been investigated, and it was concluded that methods for drying peat failed when applied to pigments because the current density was not high enough, and at higher current density the heat developed affected the pigment adversely.

Another matter mentioned in the paper was a method of reducing coarse pigment particles, particularly extenders, to sizes in the region of 1/1,000 millimetre. Those pigments were termed "microminerals," and the process by which they were prepared was termed "micronising." The process consisted of projecting the material at high speed into a cyclone under a pressure of about 180 lb. and at a temperature of 600° F. The particles were classified by centrifugal force, and the degree of fineness could be regulated to produce certain maximum sizes, *e.g.*, 20, 10, 5, 3 microns, or even finer if desired. Doubtless, said Dr. Samuels, the process would prove valuable for certain extenders, but in general the ultimate particle size of most modern pigments was sufficiently small for practical purposes.

Inasmuch as the problem of dispersion was to be dealt with in future papers before the Association, Dr. Samuels did not deal with it at length, but discussed the contribution which could be made to its solution by the pigment manufacturers. Modifications of surface properties had been suggested, such as the simple heat treatment of antimony sulphide, whereby with little change in colour value the adhesion tension to benzene was lowered from 78.4 to 47.0 and was raised to water from 58.5 to 76.0. Precipitated pigments did not lend themselves readily, however, to modification of their surface characteristics except by the addition of a second substance. He discussed the efforts of pigment manufacturers in that direction, the principle involved being the formation on the pigment of a superficial layer of a substance which would render the particles more easily wettable by a vehicle. In certain cases those substances were adsorbed and orientated on the surface of the pigment and were frequently monomolecular in dimension. Indeed, it had been suggested that layers of fatty acids either more or less than monomolecular were less effective.

While all the many pre-treatment agents mentioned in the literature were not likely to become of commercial interest, he referred to a few to indicate the general trend. Fatty acids which were applied to pigment surfaces by various means included stearic, oleic, palmitic and lauric or their salts. The soaps of fatty acids and natural resins had also been used; in particular, aluminium stearate had been recommended, and it was claimed for pigments so treated that a considerable saving in oil could be effected in addition to more ready incorporation into paint vehicles. An interesting case of pigment pre-treatment was the use of methyl cellulose. It was used in connection with an investigation of floating and the separation of two pigments differing in their surface characteristics.

Discussing the so-called flushing process for transferring a water-wet pigment directly to an oil-wet condition (used in order to avoid the drying and pre-treatment processes), he said it was sometimes thought that flushing produced a printing ink of greater strength than that made from dry colour, but it was his experience that, provided the flushing was properly carried out, the ink was neither stronger nor weaker than an equivalent ink from dry colour. There were certain small advantages in quality to be looked for from the flushing process, but its main virtues appeared to lay in the saving of time and power costs.

The Dispersion of Pigments

As to the dispersion of pigments in aqueous media, he mentioned a patent covering the manufacture of dispersed pastes of phthalocyanines by milling with water-soluble dispersing agents, such as sulphonated oils and sulphated higher fatty alcohols. An example of treatment for the manufacture of pigment powders readily re-dispersible in aqueous media was the admixture of pigments with reversible colloidal silicates of aluminium, *e.g.*, bentonite and wetting agents such as the sulphuric esters of high molecular weight, aliphatic alcohols or fatty acid esters or amides containing sulphonic groups. It was impossible to say, yet what was likely to become the general practice in industry with regard to surface pre-treatment.

Discussion

DR. G. F. NEW, president, said it seemed to him, from the way in which pigment makers were drawing on synthetic pigment and wetting agent developments that possibly we were all aiming at a coloured wetting agent with resinous properties or a coloured resin with wetting properties, so that possibly we should have one body combining all three functions ultimately.

MR. K. MACKENZIE RICHARDS, referring to the mixed crystals of lead sulphate and lead chromate, and the statement that the monoclinic form was faster to light than the rhombic form, asked whether the author had had any practical experience of that, because he personally had thought that the rhombic form was the faster to light, if there were any difference at all. The Home Office test for "soluble lead" content had been a source of a good deal of discussion and dispute between paint manufacturers and their customers, and it was interesting to hear how the scarlet chromes could be made to conform to the Home Office test.

With regard to surface pre-treatment agents and the statement that layers of fatty acids formed on pigment surfaces should be only of monomolecular dimension, he asked if there were any confirmatory evidence of the suggestion that a monomolecular layer was more effective than a layer of greater dimension.

The flushing of colours had been adopted to an increasing extent recently; but a recent American paper had summed-up the position fairly well, and it seemed that if a pigment and the vehicle in which it was used were properly designed for their job, just as good a result should be obtained by drying and grinding the pigment as by flushing.

DR. SAMUELS said he had stated in the paper that he did not think there was any great advantage to be derived in respect of working properties as the result of flushing. Certain advantages, particularly in respect of gloss, were derived, but people better qualified than he to express an opinion considered that there was a saving in time, particularly milling time, which was important to an ink maker.

It was claimed in a recent publication that the layer of substance formed on a pigment surface, to render the particles more easily wettable, must be monomolecular. Possibly the reason was that if too much wetting agent were used it was liable to affect the flow or other properties of the ink.

He believed Gardner had confirmed recently that the monoclinic form of chrome was faster to light than the rhombic, but that it was not so fast to water, and Gardner had made certain recommendations concerning the media to be used in order to overcome that deficiency in water.

DR. H. W. KEENAN said it looked as though Monastral Blue ought to be something of a co-ordination compound. He asked what was the upper limit of temperature that it would stand, because if it were used at any temperature it seemed to decompose into a body which looked like a simple copper compound. He would like to know whether that was due to the Monastral Blue itself or to some property of the medium in which it was used. Sometimes it turned to a peculiar sort of brown.

With regard to the toxicity of lead in lead chrome, he said he did not know how the Home Office had arrived at the percentages of soluble lead salts specified in the Home Office test, but he doubted that the percentages specified would ever harm anybody. He asked whether there was any prospect of specifying more practical proportions, which would help the manufacturers, for they had to affix labels stating that their products contained lead, although they knew full well that the amount of lead they contained would not harm anybody.

Another question was whether the author had noted any difference in the darkening of chrome resulting from the use of phenolic resins.

DR. SAMUELS said that he had not had a great deal of experience of the effect of phenolic resins on the darkening of lead chrome, but he imagined that it depended on the quality of the phenolic resins; he could not give details regarding variations in quality which might affect the chrome.

He was not aware that the Home Office test for soluble lead was under consideration by any Committee. The strength of acid had been chosen as being the acidity of the gastric juices, but why the figure of 5 per cent. was arrived at he did not know. Again, he did not know what was a fatal dose of lead; but he believed its effect was cumulative, and that might be the reason for specifying a low limit.

As to the browning of Monastral Blue as the result of heat, he said he did not know why Dr. Keenan had automatically blamed the pigment, but definitely a Monastral Blue could be supplied which would not undergo any serious change. It would withstand temperature up to 200° C. without change, and he suggested that the browning effect was due to some yellowing of the medium; a slight yellowing of the medium would show up quite readily by producing a reddish brown colour.

MR. H. A. LINFOOT, bearing in mind the controversies as to the merits and de-merits of flushed colours, suggested that it was not fair to say they were either better than or not so good as the dry pigments; it all depended on the type of pigment, and one had to choose one's pigments. Some classes of pigments, particularly the "Brillfast" panel type, lent themselves to the flushing process. The production of those pigments, of course, was expensive in many cases, but where extra strength was obtained it would offset the increased cost.

References had been made to an article on the subject appearing in an American journal, but it was only fair to say that the pigments cited therein were such as did not lend themselves readily to dispersion. Generally speaking, pigments which tended to dry hard in the ordinary way very often gave very superior results when flushed.

DR. SAMUELS added that mention had been made of a pigment flocculating after it had been flushed. That was quite possible, of course, if one did not start with the right paste. After all, one could have an aqueous paste which was flocculated and which might not disperse properly in the oil in the first place.

DR. R. BHATTACHARYA pointed out that the effect of copper on rubber was very bad, and he asked whether Monastral Blue would have a bad effect on rubber by reason of the copper it contained.

DR. SAMUELS replied that the copper in Monastral Blue was mostly combined, but there might be slight traces of copper free. In America, Monastral Blue or its equivalent was being used very widely in rubber, but he would not like to make a recommendation one way or the other at the present stage concerning the copper salt.

MR. R. F. BOWLES asked why the phthalocyanine colours were so very stable, particularly to light, for that was not always the case with other colours of similar constitution. Arising from that, he asked also whether researches had shown the reasons why any particular colour should be more fast to light than another colour.

DR. SAMUELS replied that very little work had been done on fundamental light fastness. It was true that many of the complex compounds were not fast to light away from their natural positions, as were the phthalocyanines, and not all the metals of the phthalocyanines were equally fast to light. The magnesium was perhaps not so fast to light as the copper phthalocyanine. He did not know the reason, but imagined that it had something to do with the special arrangement of the atoms.

Decomposition of Coal

Composition and Quantity of Volatile Products

THE relation of the composition and quantity of the volatile products obtained by the decomposition of coal, to the percentages of hydrogen and oxygen in the initial materials, has been studied by Spooner (*J. Inst. Fuel*, 1937, *11*, 134-140). Thirty different samples of coals from English, Welsh, Canadian, American and South African mines, were carbonised at temperatures between 500° and 900° C.

It was found that the quantity of oxides of carbon and water formed were directly proportional to the oxygen content of the coal. The amount of the remaining products are directly proportional to the hydrogen content of the coal. When the latter is below 3.5 per cent., light oil, ethylene and ethane are the chief products, whilst tar is formed when the percentage rises above 4.2 per cent. Methane formation is proportional to the hydrogen percentage up to 4.2 per cent., but is practically independent of it above this figure. If the gaseous products impinge upon a hot surface, the tar cracks to form light oil, ethylene and methane; at higher temperatures the ethylene and methane are themselves decomposed. Coals of high oxygen content showed a tendency for the water formed in the carbonisation to react with the carbon.

Institute of Chemistry

Result of Vote on Proposed Petition for Supplemental Charter

THE result of the voting of the Fellows and Associates of the Institute of Chemistry on the proposal to petition the King for a supplemental charter, which was under consideration at a special general meeting of the Institute held on November 19, has been announced as follows:—

	For.	Against.
Fellows	576	380
Associates	810	1063
	1386	1443
Majority against		57

Of the Fellows and Associates who could have voted, rather less than one-half actually recorded their votes. Of the Fellows voting, the majority in favour of the proposal was 196; of the Associates voting, a majority of 253 voted against the proposal.

THE new rayon factory belonging to the Petrosani Mining Co., at Lupeni, will shortly be ready for production.

American Chemicals and Equipment

Progress Demonstrated by Exhibits at the Recent Chemical Exposition in New York

THE 16th Exposition of Chemical Industries, held in New York, December 6 to 11, set a new standard for comprehensiveness and technical accuracy. There were 300 exhibitors and every leading phase of American chemical industry was portrayed graphically.

New Research Achievements

New research achievements included emulsifying agents, synthetic waxes and resins, and a high-boiling, mild-odoured plasticising oil for resins. Other organic materials on display included glyceryl stearate, glyceryl laurate, hydroxylamine hydrochloride, hydroxylamine sulphate, benzanilide, para-hydroxy phenyl glycine, and phenylhydrazine hydrochloride. Speciality materials for unusual applications in industry included cæsium and rubidium salts for the manufacture of radio and cathode ray tubes, amorphous boron, activated carbon for removing odours and tastes from liquids, diatomaceous earth products, and compressed gases for every type of industrial processing and for refrigeration. A large manufacturer of explosives drew attention to research achievements in terms of a chlorinated rubber base designed to give longer life to paints, a low cost resin for use in varnishes and insulating compounds, various synthetic resins, a liquid resin resistant to water and alkali, and a liquid resin with plasticising and adhesive characteristics. Synthetic resins were of many varieties, including phenolic, cellulose acetate, coumarone-indene, and thermoplastic cycloparaffin. Silicates, particularly those of sodium, were well represented, one exhibitor showing thirty-three different kinds. A new modified silicate adhesive was also exhibited; recently discovered in the process of manufacturing silicate-clay adhesives, it is said to be of unusual potential value to the corrugated board industry.

The role of metals and alloys in chemical engineering construction was demonstrated by comprehensive exhibits of steel and corrosion-resistant alloys, and of the non-ferrous metals such as aluminium, copper, brass, and bronze. The weldability of stainless steels was demonstrated. Other items in the metals section included special tubing for a variety of process applications, pressed steel tanks, woven wire fabrics, wire rope, and couplings. Valves in brass, aluminium alloy, steel, and nickel, and in all sizes, were shown for services involving a complete range of pressure and temperature conditions. Crucible-refined, high-silicon iron was a featured metal for construction of acid-handling equipment. Steel exhibits featured black, scale-free pipe, galvanised scale-free pipe, ammonia piping, and seamless condenser tubes. Still tubes made of chromium alloy with additions of molybdenum and titanium were shown. One exhibit reflected the commercial development of tungsten and molybdenum sheets, now available in thickness down to one one-thousandth of an inch. Stainless steel tubing is now more valuable to users in the chemical industry because of its additional strength and corrosion resistance.

Applications of Titaniun and Zirconium

The practical use of titanium and zirconium in the chemical fields is relatively new, but one exhibit was devoted to their recent applications. Featured were the metals themselves, their salts, oxides, and silicates. Interesting applications included opacifying vitreous enamels, manufacture of welding rod fluxes, processing ceramic bodies, and for glaze work.

Specialised applications of lead and its alloys included homogeneous lead-lined vacuum apparatus, evaporator tanks, steam-jacketed kettles, digesters, heating and cooling coils. The aim of corrosion resistant construction of the lead-lined type is to secure a combination of the acid resisting qualities of lead plus the strength of steel and copper. Related metal products on display included antimonial sheet lead, and tellurium sheet lead. Process equipment utilising these metals included vacuum concentrators for spent sulphuric acid, chamber acid, and sludge acid, and vacuum evaporators for weak solutions of sulphuric acid and phosphoric acids.

A self-contained pulverising unit embodied grinding the material by itself and upon itself in a high intensity air vortex and providing for a positive and selective classification of the product. Grinding by means of a "canned tornado" is the way it was described. The material to be ground is reduced in particle size by being swirled around upon itself in a confined air vortex having a velocity of 300 to 400 miles per hour In this section, a feature worthy of especial mention was the new automatic control for the electrical equipment on pulverisers; with this system the mechanical feeders on pulverising machines can never pile up a load or jam the mechanism. Noteworthy in the field of classification of solids was an air-cooled, serrated magnetic pulley for removing iron from ore.

The separation of solids from liquids and the related problems of clarification and sterilisation were well represented. Equipment was applicable to the various process industries, likewise to municipal problem of water purification and sewage disposal. In addition to the customary fabric and woven wire media, filter cloth woven of glass was on display. Special attention was given to speeding up time and increasing efficiency in the handling of "unfilterables." A new interwoven, spiral wire matrix fabric is used to support and back collector bags, filter cloths; also for the separation of dialysing membranes. A new design of automatic filter was shown for replacing the old-time bag houses in the smelting field. Self-cleaning filters of the backwash type featured no loss of backwash fluid, and low pressure drop. A new automatic self-cleaning filter operated by hydraulic mechanism was shown for the first time.

Improvements in Centrifugals

Centrifugals generally featured the conversion from batch to continuous operation. Centrifugal filtering now takes its place with other continuous flow operations. The mechanical achievement means enormous increases in efficiency and economy in many process industries. Batch centrifugals featured new methods of reducing spindle and basket speed to extremely low revolutions per minute, making them better adapted to unloading operation. Bronze, steel, and aluminium were materials chosen for basket construction. A magnetic separator for removing iron and other magnetic particles from suspension in liquids was heralded as useful to the pottery and enamelling fields as a guard against iron spots. It is found practical for the removal of iron impurities in materials which have been ground with steel balls, or for removing traces from iron bearing minerals.

For the continuous drying of a wide range of wet solid materials, an amplified drum drier was exhibited. This unit is used for drying such commodities as lithopone, white lead, zinc carbonate, titanium oxide, magnesium carbonate, calcium carbonate and copper sulphate. In operation, the drum predries and pre-forms the material into small sticks of equal size, shape and density. The sticks are then deposited in a uniform layer on a conveyor where the final moisture is removed speedily and thoroughly. Other dryers on display included "super dryers with oscillating type feed," rotary test ovens, revolving cylindrical dryers, and rotary steam dryers.

UTILISATION of pinewood stumps and waste is the object of the newly-formed Stockholz-Verwertungsgesellschaft m.b.H (capital 100,000 marks).

New I.C.I. Laboratories at Manchester

A Building of Novel Design

NEW laboratories have been built for the Dyestuffs Group of Imperial Chemical Industries, Ltd., at Blackley, Manchester, and were opened on Tuesday by Mr. John Rogers, a director of I.C.I. A Press visit was held on Monday, and the party was shown over the laboratories, where a large number of interesting exhibits were inspected. The laboratories have been necessitated by the rapidly expanding activities of the company in the field of large-scale organic chemical research, and it is understood that the present building is only the first section of a possible long-term extension programme.

Construction of the Laboratories

The new laboratories were designed by Mr. Serge Chermayeff, F.R.I.B.A., and are housed in the main block of a 400 ft. long, three-storey building. There are twenty-one laboratories which are entered from a corridor running the whole length of the building on the west side. Planned to accommodate a hundred research chemists and their assistants, they are arranged so as to compromise between the more usual alternative plans of housing twenty or thirty chemists in one large laboratory, and of giving each worker a smaller laboratory to himself. In the system adopted, four chemists share a large laboratory, so arranged as to give each a measure of privacy without completely isolating him. A single standard structural unit has been used throughout the building and in the laboratories each unit contains all accommodation and technical services for two chemists.

A break has been made from traditional laboratory design by adopting the multi-floor block principle, which makes for more compact planning of the working space and communications, greater flexibility and accessibility of services, more practical orientation of private offices, and the release of space for gardens between the buildings. The north light has been abandoned in favour of east and west fenestration with artificial diffusion to provide a maximum of daylight to every part. Wall surfaces have been reduced to a minimum by the generous use of glass for lighting. Some effort has been made to provide stimulating surroundings by a varied use of colour. Acid- and steam-resisting paints are used in different colours against a background of white. Each floor has a different colour for the entrance to the laboratories, and the laboratories themselves are finished in a variation of the floor colour. The flooring throughout the working space is of cork tile laid in bitumen.

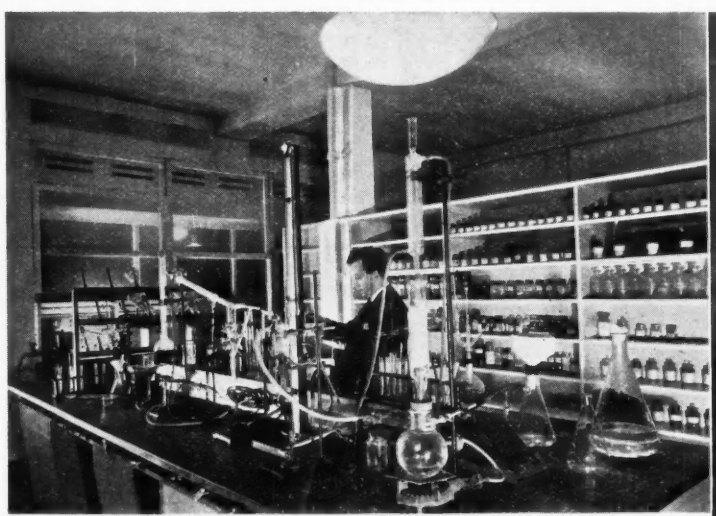
Consistently good ventilation, independent of weather and the impurities of the atmosphere, in an industrial district is secured by artificial air conditioning by a central plenum plant. The purified air, the temperature of which is automatically controlled according to outside conditions, is conveyed to each individual working space through ducts running along the corridor for the whole length of the building. Used air is removed partly by displacement under pressure from the incoming fresh air and partly by an extract duct running parallel to the intake in the corridor ceiling. Gases are withdrawn from the fume cupboards by high velocity extraction through an entirely independent system of vertical ducts.

There are two series of service ducts to fume cupboards and laboratory benches in all parts of the building. All branches of vertical services and drainage are carried by a continuous duct running under the building for its whole length; other services through shallow horizontal ducts, with removable covers, passing through the laboratory floors under the benches. All service pipes, cables and their control are easily accessible at any point. Balances are provided in each individual laboratory, but in addition there is a special balance room in a central position on each floor, with specially isolated benches for more delicate weighing.

The Exhibits

The exhibition which had been arranged in the new building, was designed to give a bird's eye view of the progress of organic chemistry. The exhibits were excellently displayed and evidently a great deal of trouble had been taken with the organisation of the whole exhibition. In the first laboratory the exhibits showed how coal tar was first exploited and how the results obtained by chemical investigation were fitted into a growing body of chemical philosophy. Early theories of atomic and molecular structure were illustrated by original drawings and models, and samples of the early synthetic dyestuffs, diazo compounds, and the work of Graebe and Liebermann on the synthesis of alizarin, were illustrated.

An interesting connection was shown between modern ideas



Above : a view of one of the new laboratories. Right : fume cupboards backing on to a main corridor, with part of the panelling removed to show accessibility of the various services (steam, compressed air, vacuum, etc.) The electric motor in the foreground drives the main stirring shaft for all the laboratories on this floor. All the pipes for the various services are painted with denominating colours.

of architecture and that of organic chemical synthesis. With increasing knowledge the chemist is able to build up molecules of more and more complex structure, and, as in the field of architecture, so in synthetic chemistry, different periods show different styles. Examples were given of some types of chemical architecture.

A main group of the exhibits was naturally concerned with dyestuffs, how they were first prepared, modifications which can be introduced into their synthesis, and new products which have recently been introduced. A chart in the form of a genealogical tree showed how the various classes of technical azo dyestuffs had been derived from the diazo compounds, the versatility of the coupling reaction, and the selective affinity of textile fibres for azo dyestuffs. Exhibits illustrating the application of azo dyestuffs included mordant azo wool dyestuffs, application to cotton and viscose by direct dyeing, formation on the fibre, azo dyestuffs for acetate rayon (the most recent feature being the development by I.C.I. of the Solacet range) and miscellaneous applications. A key chart showed the derivatives of alizarin intermediates and allied products, and the development of alizarin intermediates and dyestuffs was illustrated in detail. A whole range of samples illustrated the various stages in the manufacture of anthraquinone from crude anthracene, as well as samples of anthraquinone intermediates and derivatives. Samples of Lactam and Carbolan dyestuffs, together with different textile materials dyed with these two classes, were shown. The Carbolan dyes merit special mention. They give dyeings on wool which are fast to washing, milling, etc.—an important development.

Development of the Vat Dyestuffs

Another laboratory was mainly concerned with the historical development of the vat dyestuffs and recent novel vat dyestuffs, such as the Caledons. The use of the Soledon dyestuffs in dyeing was also described. A separate series of exhibits was devoted to the production of, and dyeings with, indigo, indigoid and thioindigo dyestuffs, and the method of dyeing with Duranol dyestuffs and indications of their use in printing, etc. The Duranol dyes are noteworthy in that they were the first range of dyestuffs specially designed to dye acetate rayon. Samples of natural, inorganic and organic pigments were displayed from the historical point of view and the modern applications of present-day organic pigments, such as the phthalocyanines, were illustrated. The remaining groups of dyestuffs were treated by exhibits showing the discovery of mauveine and the development of other basic colours, the preparation of a triphenylmethane dyestuff, dyeing with a basic dyestuff, and the preparation and uses of sulphur dyestuffs. An interesting exhibit was concerned with the less usual applications of dyestuffs, for examples in dyed metal sheet, foil and powder, dyed wood, foodstuffs and cosmetics.

Another laboratory showed the wide variety of problems investigated by the Technical Service Departments, and how their work is carried out from receipt of the customer's inquiry until the dispatch of the report. The Rubber and Resin Service Department staged a separate exhibit showing typical rubber testing machines, and a new machine for testing the internal friction of rubber. A demonstration was also given of the direct production of rubber articles from latex by dipping.

The development of synthetic rubber was a feature of the exhibition and phases of the early work on the subject were exemplified. The story was brought up to date by exhibits designed to show the advantages of Neoprene over natural rubber, and some of the industrial applications which Neoprene finds. Other samples of synthetic rubbers included polymerised dienes, chloroprene, and rubbers of the ethylene polysulphide type.

In addition to the older synthetic resins, such as phenol-formaldehyde, alkyd and urea formaldehyde, which are well-known in the form of moulded articles of all types, recently discovered products, the acrylic and vinyl resins, were on

(*Continued on next column.*)

British Association Meeting

Suggested Discussion Subjects

LORD RAYLEIGH has been installed as president of the British Association for 1938, in succession to Sir Edward Poulton. He took the chair at a conference, held at Birkbeck College, on January 7, at which the main outlines of the programme for this year's Cambridge meeting of the Association were discussed by the organising committees of the various sections.

PROFESSOR W. W. WATTS, who presided at the outset, explained that Sir Edward Poulton could not be present because he had had a fall a fortnight ago and his doctor pronounced him not yet fit to make the journey. The Association welcomed Lord Rayleigh on account of his marvellous scientific research work and his successful association with other scientific societies and their organisation.

LORD RAYLEIGH, from the chair, said he had jotted down a few headings, lying quite outside his own real knowledge, as suggestions for possible discussions in the various sections at the Cambridge meeting. In Section A he thought they might usefully have something about the modern magnetic alloys. There was a good deal of modern knowledge of them from the X-ray direction, and he thought Professor Bragg would be willing to lead in a discussion. A subject touching on both chemistry and biology was the processes by which rare elements were segregated in the earth. It seemed to him that some discussion of those processes, which seemed to be very marvellous examples of selective crystallisation, and comparison of them with the artificial processes of the laboratory might afford the basis of an interesting discussion.

British Industries Fair

Six Royal Visits

IT is announced by the Department of Overseas Trade that the King and Queen, and Queen Mary, will pay the following visits to the British Industries Fair, which opens in London and Birmingham on February 21:—February 21, Earls Court (morning): the Queen; (afternoon): Queen Mary. February 22, Olympia (morning): the King and Queen and Queen Mary. February 23, Earls Court (morning): the King. February 24, Olympia (morning): the Queen and Queen Mary. March 1, Birmingham (morning): the Duke of Kent.

(*Continued from preceding column.*)

Diakon and Perspex, such as shapings for use in aircraft and lenses.

A portion of the exhibition was concerned with technique; namely, dispersions of solids, liquids, and the testing of dispersions, and the purification and separation of mixtures. There were also shown some of the applications of catalysis in hydrogenation and in the manufacture of phthalic anhydride.

In the analytical laboratory the development of the micro method from the classical method was illustrated together with exhibits illustrating colorimetric and electrolytic methods of analysis.

An interesting section of the show was concerned with auxiliary chemicals for the textile trade. These included the process of permanent softening and waterproofing by means of Velan PF, the stripping of insoluble azo dyes by means of Lissolamines, the prevention of frothing, anti-rubbing and de-electrification of acetate rayon. Samples of detergents, wetting agents, softening, emulsifying, anti-mildew agents were also displayed.

Finally, the application of chemical products to pest control was shown. These included synthetic contact insecticides and emulsifiers, synthetic fumigants and fungicides, and the use of Hortomone A in the striking of cuttings for stimulating root growth. Medicinal chemicals shown included anæsthetics and hypnotics, the use of synthetic compounds in X-ray diagnosis, and the methods now in use for combating malaria, tropical sleeping sickness and sepsis.

New Anti-knock Petrol

Production to Start in Holland

A NEW motor spirit especially suitable for aircraft will be produced shortly by a process owned by the Universal Oil Products Co. and the International Hydrogenation Patent Co., both of which are affiliated to the Royal Dutch-Shell group.

The process to be used is believed to be that of catalytic polymerisation, which has been perfected by the Universal Oil Products Co. Under this process petrol with an octane rating of 95-96 is produced, which means that it is practically knock-free. No. 1 grade petrol has an octane rating of around 70. Petrol produced under this process has excellent blending qualities, and it enhances the octane rating of any motor spirit mixed with it.

The Universal Oil Products Co., which is essentially a research company, was the first to develop a cracking process whereby the gasoline yield was greatly increased. The process, which is known as the Dubbs process, has made cracking a paying proposition. The Universal Oil Products Co. is licensing this and other processes developed by it, and so useful are they to refiners that, when control of the company was acquired in 1931 by the Royal Dutch-Shell group and the Standard Oil Co. of California, $25,000,000 was paid for the company's shares.

Anhydrous Sodium Sulphate

Production from Lake Crystals

THE production of 175 tons of anhydrous sodium sulphate per day from lake crystals is descibed by Pierce (*Chem. Met. Eng.*, 1937, *44*, 717-720). The crystals, which initially contain 60 per cent. of water by weight, are washed in a log washer to remove insoluble matter, and are then melted in a rotary melter, the liquid produced being pumped to atmospheric drum dryers, where the water content is reduced to 27 per cent. These driers are 10 ft. long and 4 ft. diameter, and are heated by low pressure steam. The product from this treatment is conveyed by a screw to a direct fired rotary kiln, where complete dehydration is effected, the temperature of the emergent crystals being 248-284° F. They contain 99 per cent. of Na_2SO_4, and are perfectly white and free running.

This process has eliminated completely the common trouble in drying sulphate crystals, namely, caking in the kiln. Caking occurs only with material having a water content of between 56 and 30 per cent., and is thus avoided by reducing the water content to 27 per cent. before discharging the crystals into the kiln.

Glass-making Sands

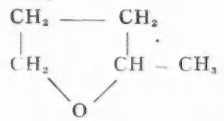
Method for Removal of Iron Oxide Impurities

A METHOD for the removal of iron oxide impurities in glass-making sands is described by Adams (*J. Soc. Glass Tech.*, 1937, *21*, 409-413). The sand is first thoroughly washed with water by upward displacement to remove clay, the suspension of clay being settled in a Dorr classifier, the overflow from which is recirculated in the washing system. The washed sand is then repulped with half its weight of a 0.5 per cent. solution of acid sodium oxalate, containing some $FeSO_4$, the solution being at 180° F., at which temperature the suspension is maintained by direct steam. Here the ferric oxide is reduced to the ferrous condition, and dissolved, and when this is completed the suspension is pumped to a classifier and thence to a rotary filter. The solution recovered is regenerated by adding a very small excess of sodium hydroxide to precipitate the iron salts and silt. A little sodium oxalate is added to make up for the losses and dilution, and sulphuric acid is added in quantity sufficient to give the acid salt.

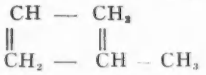
Synthetic Rubber

Polymerisation of Hydrogenated Furfural

INTERESTING possibilities in the utilisation of furfural as a raw material for synthetic rubber are suggested by a new process patented by the Usines de Melle and M. Guinot (Fr. Pat. 811,695). Hydrogenation of furfural under certain conditions, it is claimed, gives an exceptionally high yield of tetrahydromethyl furane,



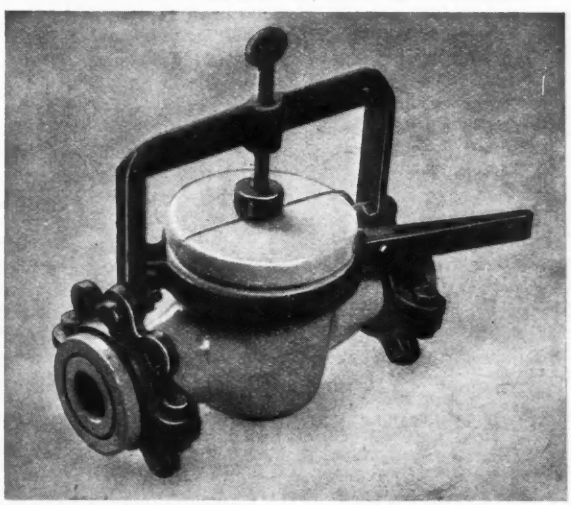
which readily splits off water to give piperylene,



The latter substance (b.p. 42° C., sp. gr. 0.679) can be polymerised to a rubber-like product by the usual methods practised for the butadiene family of synthetic rubbers now in production in various countries (*e.g.* by warming in presence of sodium wire). With furfural now at a very low price (the lowest in its history), the process may well lead to a considerable expansion in its use.

According to the specification, the hydrogenation of furfural is concluded in two stages; the first (in presence of a copper catalyst) yields methyl furane and the second (in presence of a reduced nickel catalyst at a low temperature) completes the hydrogenation of the furane ring to tetrahydromethyl furane in 85 per cent. yield. Conversion of the latter to piperylene (in 90 per cent. yield) is effected by passage over aluminium phosphate which has been calcined at 350° C.

AN experimental plant for synthetic fatty acids from paraffin wax at Witten (Ruhr) was erected in 1936 and now has an annual capacity of 20,000 tons. Wax-like by-products from petrol synthesis are the raw materials and the fatty acids form a satisfactory basis for soap manufacture. It is proposed to build two additional plants with an annual capacity of 20,000 tons each.



This new stoneware acid cock, made by Doulton and Co., Ltd., is said to eliminate sticking or "seizing up" entirely. By means of a specially designed stoneware ring to which is attached a metal handle, gentle pressure is sufficient to allow the tap to turn quite freely. No grease or other lubricant is necessary. The cock is supplied in many different patterns and sizes and gives absolute safety when in use. In the case of ordinary stoneware cocks, if the conical key is inclined to "seize up," considerable force may be required to move it with possible damage and danger.

New Technical Books

HIGH TEMPERATURE WELDING FLAMES. By D. Seferian. Translated by M. G. Ribaud. Pp. 51. London: Penton Publishing Co., Ltd. 3s. 9d.

The author of this book has not given just a purely practical paper on the flames used for welding, but has prefaced his publication with a complete scientific introduction. Thermodynamic calculation of flame temperature requires data upon (a) the number of calories liberated by combustion of the gas, (b) the dissociation constants of the products of combustion, and (c) the specific heats under constant pressure of gases at high temperatures. The temperatures calculated using these data have always given values which differ from those measured, even if the various dissociation constants are taken into account. The author, therefore, first outlines the modern theory of the specific heats of gases at high temperatures. He then deals briefly with the calculation of dissociation constants for the constituents of the flame. Finally, he reconsiders the oxyacetylene flame in the light of the recent values of specific heats and compares it with other flames which, it has been suggested, might find industrial application for the welding of metals and alloys.

THE PRINCIPLES AND PRACTICE OF LUBRICATION. By Alfred W. Nash and A. R. Bowen. Second edition, revised. pp. 345. London: Chapman and Hall, Ltd. 18s.

This book summarises the salient features of the subject of friction and lubrication and should prove of value to petroleum technologists, students, engineers, oil salesmen and all users of machinery. Scientific principles are given in non-technical language as far as possible, so that readers with only a slight knowledge of chemistry and physics should have no difficulty in following all that the author has written. The present-day importance of the lubricating oil industry can be gauged from the consumption of lubricating oil, which in the United Kingdom alone amounts to about 115,000,000 gallons per year, about 30 per cent. of this quantity finding use as motor lubricants. The lubrication specialist, with a sound training in mechanical engineering, and an intimate understanding of the friction problems involved in power transmission, as well as a knowledge of the chemical and physical properties of petroleum and lubricating oils, should be able to recommend a suitable lubricant and the best means of applying it; in addition, he should be able to carry out tests—in the laboratory and under practical condition of working—to prove his contentions. The book under review will equip an aspirant most ably for this work, even in the absence of a lengthy experience it should enable him to discuss the theory and practice of lubrication in terms that can be followed equally well by the research worker, the practical engineer and the working foreman. The lubricating oil salesman, who should have a sound knowledge of the theory and practical application of his products, may also read profitably, because some of the many helpful hints which are included in the present text may do more for his clientele than hours of persuasion. A particularly useful chapter on "the care of lubricants" has been included; references to the literature, and illustrations in explanation of the text, are numerous, and there is also an appendix of tables of data which may be constantly needed.

ANALYTICAL CHEMISTRY. Based on the German text of F. P. Treadwell. Translated and revised by William T. Hall. Vol. I. Qualitative Analysis. Ninth English edition. pp. 630. London: Chapman and Hall, Ltd. 22s. 6d.

Many changes have been made in this new edition of "Treadwell and Hall." Part I, dealing with the principles upon which analytical chemistry is based, has been largely rewritten to make it agree more closely with modern chemical theory. Part II, treating of the reactions of cations, has been rearranged. Parts III, IV and V cover reactions of the acid constituents (anions), systematic analysis, and reactions of some of the rarer metals, respectively. Throughout the book generally, a considerable amount of new material has been introduced; many new tests have been described with special attention to drop reactions. Included in Part IV, is a new supplement giving procedure for semi-microchemical analysis (12 pages). For the analysis of each group of cations, a single scheme of analysis is now recommended. In order to keep down the price of the book certain portions of the original text have had to be discarded or shortened; for instance, the section on spectroscopy has been shortened. The omission which has been made with the most regret, however, is the scheme of Noyes and Bray for the analysis of the rare and common metals.

MODERN RUBBER CHEMISTRY. By Harry Barron. pp. 342. London: Hutchinson's Scientific and Technical Publications. 18s.

In this comprehensive survey of the behaviour of rubber and latex in every phase of their commercial applications, the author puts forward the essentials of rubber practice in simple and understandable language, and by a careful distribution of the chapters he deals with the significance of all the chemical principles that are involved. The ever-widening appeal of latex as a raw material is covered by a fascinating account of this material, its properties and behaviour, accompanied by numerous examples of its use. Synthetic rubber, reclaimed rubber and rubber powder are dealt with, and many features of interest are incorporated for the first time in the permanent literature on the subject. In the actual words of the author: "Until just after the war, rubber manufacture was almost entirely based on empirical methods. In recent years a complicated scientific superstructure has been erected on this empirical basis and grows with alarming rapidity every year. This book is an effort to put forward the scientific principles of rubber manufacture as at present understood." Descriptions of many rubber manufacturing processes are included, because they necessarily form the background of any study of rubber chemistry. A chapter on the direct use of latex has been included, and should be especially welcomed by the industrialist and inventor, in view of the fact that the widespread use of latex during recent years has carried rubber into innumerable diverse industries. There is also a chapter on the analysis of rubber which might be profitably read in many laboratories.

National Physical Laboratory Researches

A New Series of Abstracts

ABSTRACTS of official papers made public by the National Physical Laboratory during the year 1936 have been printed as a Stationery Office publication (price 1s.). Most of the papers have appeared in the proceedings and transactions of scientific and technical societies and institutions, and in the technical press. The new publication is the first of a series which will be issued annually.

The purpose of these abstracts is to provide a concise summary of the completed work of the laboratory, supplementing the information given in the annual reports, and it is hoped that they will prove useful to industrial firms, research organisations, and scientific workers generally. It is the practice of the laboratory to present accounts of completed items of its general research programme to the institutions or journals appropriate for bringing the work to the attention of the technical public most closely concerned. Frequently, however, a paper is of interest in several branches of industry, and the abstracts should ensure that in such cases the work is brought to the notice of all who might find it of value. The abstracts are intended to supersede the "Collected Researches" of the laboratory, which will be discontinued on the publication of Vol. 24, dealing with standards, which is now in the press; Vol. 25, containing papers on metallurgy, has already appeared.

References to Current Literature

Inorganic

Anhydrous sodium sulphate. Pierce, *Canadian Chem. Met.*, *44*, 718-724.

Xenon. Clusius and Riccoboni, *Z. Phys. Chem.*, B., *38*, 81-95.

Per-salts obtained by the action of hydrogen peroxide. Rumpf. *Annal. Chim.*, *8*, 456-527.

Rare earth metals and compounds. Quill and Robey, *J. Amer. Chem. Soc.*, *59*, 2,591-2,595.

Chemistry of silicates. Thilo, *Ber.*, *70*, 2,373-2,381.

Organic

Alkylation with a hydrogenating catalyst. Komarewski, *J. Amer. Chem. Soc.*, *59*, 2,715-2,716.

Organo-mercuric acetates. Coleman, Weed and Myers, *J. Amer. Chem. Soc.*, *59*, 2,703-2,704.

Polyhydroxy derivatives of naphthalene. Chakravarty and Pasupati, *J.C.S.*, 1937, 1,859-1,862.

Olefines from alkyl bromides. Taylor, *J.C.S.*, 1937, 1,962-1,967.

Diethyl sulphate. Brédeau, *Rev. Prod. Chim.*, *40*, 676-679.

Sorbose from sorbitol. Wells and ors., *Ind. Eng. Chem.*, *29*, 1,385-1,388.

Autoxidation of unsaturated fatty acids. Franke and Jerkel, *Annal.*, *533*, 46-71.

Analysis

Oxygen in organic substances. Kirner, *Ind. Eng. Chem., anal. ed.*, *9*, 535-539.

Determination of anthracene in anthracene oils. Kauffmann, Baltes and Hartweg, *Ber.*, *70*, 2,559-2,560.

Silicate analysis. Hecht, *Mikrochim. Acta*, *2*, 188-208.

Microgravimetric determination of arsenic and antimony. Hecht and v. Mack, *Mikrochim. Acta*, *2*, 218-226.

Identification of aliphatic sulphonic acids. Latimer and Bost, *J. Amer. Chem. Soc.*, *59*, 2,500.

Sulphuric acid concentration in the determination of chromium in steels. Döring, *Z. Analyt. Chem.*, *111*, 49-56.

Microanalysis of carbohydrates. Strepkov. *Z. Analyt. Chem.*, *111*, 57-94.

Electrometric determination of silver. Robinson and Hugg, *Ind. Eng. Chem., anal. ed.*, *9*, 565-566.

Determining arsenic in white metals. Anderson, *Ind. Eng. Chem, anal. ed.*, *9*, 569-570.

Mineral Oil, Gas, Tar

Acidity in lubricating oils on use or oxidation. Rescorla, Carnahan and Fenske, *Ind. Eng. Chem. analyt. ed.*, *9*, 574-576.

Determining corrosive power of mineral oils. Heinze, Mardu and Van Der Heyden, *Chem. Fabrik*, *10*, 519-522.

Removal of hydrogen sulphide from gas. Demski, *Gas u. Wasserfach*, *80*, 870-873.

Distillation test of benzol wash oils. Hammer, *Gas u. Wasserfach*, *80*, 873-875.

Cellulose, Paper

On cellulose solutions. Staudinger and Daumiller, *Ber.*, *70*, 2,508-2,513.

Xylan. Bywater and ors., *J.C.S.*, 1937, 1,983-1,988.

Artificial gut from cellulose. Weingand, *Chem. Ztg.*, *62*, 7-9.

Cellulose from bagasse. Kühne, *Zellstoff u Papier*, *17*, 526-531.

Determining the degree of decomposition of sulphite cellulose. Schwabe and Fiedler, *Wochenblatt f. Papierfabrik*, *68*, 912-916.

Oxycelluloses. Staudinger and Jurisch, *Papier Fabrik (techn. Teil)*, *35*, 459-462.

Bleaching, Dyeing, Finishing

Bleaching cellulosic fibres. *Justin-Mueller, Teintex*, *2*, 750-754.

Finishing with latex-starch compositions. Hinzelin, *Teint. Imp. Blanch. App.*, *15*, 563-567.

Peroxides in bleaching processes. Dumas, *Rev. Générale Matières Colorantes*, *41*, 512-515.

Glass, Ceramics

Quartz particle size and the properties of hard porcelain. Krause, *Sprechsaal*, *70*, 623-625.

Crazing of glazed tiles. Mellor, *Trans. Ceramic Soc.*, *36*, 443-465.

Purification of glass making sands. Adams, *J. Soc. Glass Techn.*, *21*, 409-414.

Metals, Electrometallurgy

Metal colouring by electrolytic precipitation of cuprous oxide. *Metallwaren Ind. u. Galvano-Techn.*, *35*, 509-510.

Alloys for corrosion resistance. Hitchcock, *Metal Ind.*, *52*, 37-42.

Electrodeposits. Francis-Carter, *Metal Ind.*, *52*, 43-48.

Fats, Oils, Waxes

Detergents. Mullin, *Soap*, *13*, No. 12, 27-30, 73.

Improving the drying properties of sunflower oil. Rankoff, *Fette u. Seifen*, *44*, 465-471.

Determining the hydroxyl number with acetyl chloride and pyridine. Kaufmann and Funke, *Ber.*, *70*, 2,549-2,554.

Test for the rancidity of fats. Frehden, *Mikrochim. Acta*, *2*, 214-217.

Preventing autoxidation of fats and oils. Henke, *Seifensieder Ztg.*, *64*, 942.

Chemical control in soap manufacture. *Deutsche Parfüm. Ztg.*, *23*, 459-461.

Solvent extraction. Bonotto, *Oil and Soap*, *14*, 310-311.

Acorn oil. Wittka, *Fette u. Seifen*, *44*, 464-465.

Paints, Pigments, Resins

Aluminium pigment pastes. Harris, *National Paint Bull.*, *1*, No. 13, 10-11.

Aeroplane fabric finishes. Faucett, *Drugs, Oils, Paint*, *52*, 485-488.

Zinc oxide. McNaughton, *J. Oil Colour Chem. Assoc.*, *20*, 380-395.

Aluminium finishes. Halls, *Oil Colour Trades J.*, *93*, 39-43.

Electrolytic production of white lead. Sacher, *Farben Chem.*, *8*, 405-406.

Soybean oil varnishes. Lewis and Markley, *Paint Oil Chem. Rev.*, *99*, No. 26, 5.

Evaluating lacquer plasticisers. Silleck and Gardner, *Paint Oil Chem. Rev.*, *99*, No. 26, 6-7.

Rubber, Plastics

Film-forming organic compounds. Dreher, *Farbe u. Lack*, No. 46, 547-548.

Solutions of polymers. Meyer and van der Wyk, *Helv. Chim. Acta*, *20*, 1,313-1,334.

Isomerisation of rubber. Ferri, *Helv. Chim. Acta*, *20*, 1,393-1,395.

Resins from unsaturated aldehydes and acids. *Brit. Plastics*, *9*, 336-337.

Determination of the quality of latex. Davey and Coker, *Rubber Age*, *18*, 359-360.

Natural and artificial rubber and derived long-chain compounds. Guth, *Kautschuk*, *13*, 201-209.

Miscellaneous

Lutes and cements in the heavy chemical industry. Greenwood and Snelling, *Chem. and Ind.*, *56*, 1,152-1,154.

Fused silica in heating processes. Moore, *Ind. Chem.*, *13*, 502-506, 513.

Handling flammable liquids. Mitchell and Vernon, *Canadian Chem. Met.*, *44*, 733-736.

Distillery corrosion problems. Weiner, *Canadian Chem. Met.*, *44*, 710-714.

Modern synthetic tanning agents. Stather and Herfeld, *Collegium*, No. 810, 570-590.

Molybdenum compounds as catalysts. Demyll, *Matières Grasses Pétrole et Dérivés*, *29*, 314-317.

Personal Notes

MR. P. J. GRATWICK has been appointed a managing director of Courtaulds, Ltd.

MR. ROBERT CRICHTON has resigned from the board of United Steel Companies, Ltd.

MR. DONALD HAVENHAND has been appointed assistant lecturer in metallurgy at Sheffield University.

SIR LOUIS BEALE has been appointed Commissioner-General for the United Kingdom section of the New York World's Fair 1939.

SIR JOHN LOADER MAFFEY has been appointed a director of the Rio Tinto Co., who are large producers of copper and sulphur in Spain.

MR. W. P. HENDERSON, assistant chief chemist at Horwich, London, Midland and Scottish Railway Co., has been appointed chief chemist at Euston.

MR. THOMAS G. WATTS, B.Sc., of Treharne, contributed an article on the processing of coal to a special trade supplement recently issued with *The Western Mail*.

PROFESSOR E. C. C. BALY, of Liverpool University, gave a notable sectional address on the mechanism of photo-synthesis at the Indian Science Congress, at Calcutta, on January 7.

MR. W. C. MITCHELL, general manager and director of the National Oil Refineries, Flandarey, Swansea, has been elected senior vice-president of the Swansea Chamber of Commerce.

MR. EDWARD CHARLES BARLOW, of Stoke Newington, founder of Edward C. Barlow and Sons, Ltd., now merged in the Metal Box Co., Ltd., and a pioneer of the tin box making trade has left estate valued £166,778, with net personalty £156,195.

MISS E. M. C. PRENTICE, former personal shorthand typist to Mr. Anthony Eden, Foreign Secretary, who was awarded a M.B.E. in the New Year Honours, is sister to Mr. K. Risden Prentice, of Fison, Packhard and Prentice, Ltd., chemical fertiliser manufacturers, of Ipswich and Stowmarket.

MR. FREDERICK HERBERT WHITBY, of Old Colwyn, Denbigh, retired analytical chemist, has left estate valued £9,574, with net personalty £9,383. He left a number of bequests of £100 and £25 to friends who were formerly associated with W. Gossage and Sons, Ltd., soap manufacturers, Widnes.

MR. A. E. PEAK, managing director of The Clayton Aniline Co., Ltd., Manchester, has just completed 25 years' service with the company. To commemorate this association the staff presented to him an antique Georgian mahogany writing bureau and an antique Chippendale mahogany tripod table. Mr. Peak was also the recipient of a cocktail cabinet from the Clayton Aniline Co., Ltd., a pair of Chippendale armchairs from the directors of the Society of Chemical Industry in Basle, and other gifts. The presentations took place at the Grand Hotel, Manchester, on January 10. The Clayton Aniline Co., Ltd., was acquired by the Society of Chemical Industry in Basle in 1911, Mr. Peak being appointed submanager on January 1, 1913, manager on the outbreak of War in August, 1914, and managing director in 1928.

MR. WILLIAM R. GORDON, who has occupied the position of director of the Coal Utilisation Council since its formation in 1932, has resigned that post, having been appointed commercial manager of Low Temperature Carbonisation, Ltd., and the group of Coalite and coal oil companies presided over by Colonel W. A. Bristow. Mr. Gordon will enter upon his new duties on January 17. One of his first tasks will be the creation of the necessary organisation in the west and south west of England for the marketing of the products of the South Wales Coalite Co., which company, in conjunction with the Government and the Nuffield Trust, has purchased a colliery and is erecting a large plant in South Wales for the manufacture of smokeless fuel, coal petrol, diesel oil and the other usual liquid products. The other officials of Low Temperature Carbonisation, Ltd., remain unchanged.

LORD MELCHETT, who has been suffering from an overstrained heart, and is still confined to his country house, is reported to have made excellent progress. He hopes to be able to fulfil his engagements in a few weeks.

SIR WILLIAM FIRTH, chairman of Richard Thomas and Co., was presented with a silver gilt casket, containing a resolution of thanks, at a luncheon given by Ebbw Vale Council on January 12. An inscribed silver rosebowl was handed to Lady Firth. The presentations were made in appreciation of the establishment of new works at Ebbw Vale by the company.

MR. WILLIAM M. KIRKPATRICK, special representative in China of the Exports Credits Guarantee Department of the Board of Trade, has been awarded the Chilean Order of Merit, the highest honour which it is possible for the President of the Republic of Chile to bestow upon a foreigner. It has been conferred on Mr. Kirkpatrick in recognition of his services in connection with the reorganisation of the Chilean nitrate industry.

MR. PETER F. BENNETT, O.B.E., J.P., has been nominated president-elect of the Federation of British Industries. Mr. Bennett, who is chairman and managing director of Joseph Lucas, Ltd., has long taken a leading part in the work of the Federation, and during the last year he has been assisting the president, Lord Hirst, as deputy president. He has been for many years chairman of the Birmingham District Committee of the Federation. He was closely associated with the work of the Empire Committee and was present at the Ottawa Conference.

OBITUARY

MR. ANDREW THOMSON RAIT, for a long period associated with Percy and Halden, Ltd., oil and tallow merchants, Glasgow, died on January 9.

SIR JOHN HENRY BRUNEL NOBLE, Bt., of Ardkinglas, Argyll, a son of the late Sir Andrew Noble, the explosives expert, died on January 8, at the age of 72.

MR. WILLIAM BYWATER GROVE, who was lecturer in horticultural botany and chemistry at Studley Horticultural College, Warwickshire, from 1900 to 1908, died last week at his home at Erdington, at the age of 89.

MR. R. D. BUCHANAN, who took over the Linlithgow Glue Works in Preston Road in 1932, has died at Dunbarton at the age of 45. Mrs. Buchanan will carry on the business in Linlithgow, with Mr. Alex. Wood as manager.

MR. JOHN P. MILLER, J.P., of John Miller and Co. (Aberdeen), Ltd., chemical manufacturers, Sandilands Chemical Works, Miller Street, Aberdeen, has died at the age of 73. Mr. Miller was for many years senior director of the firm.

Foreign Chemical Notes

Austria

INVESTIGATIONS UPON THE PRODUCTION OF SYNTHETIC RUBBER, on the lines of the German material, Buna, are in progress at the Vienna University Chemical Institute.

Germany

RYE AND WHEAT STRAW ARE TO BE USED as raw material in the matufacture of cellulose by the recently formed Kurmärkische Zellwolle and Zellnose A.-G., share capital 1.8 million marks.

Italy

LANITAL (CASEIN WOOL) MANUFACTURE may be suspended by the Snia Viscosa, pending investigations with a view to improving the quality.

MULBERRY TREE BARK will be the starting material for a synthetic textile, known as Gelsofil, with a strength intermediate between that of cotton and linen.

From Week to Week

A GERMAN STEAMER has arrived at Houston (Texas) with 500 steel drums which will be filled with helium gas for Germany's newest Zeppelin, now under construction.

THE MEXICAN EAGLE OIL CO. has brought in a new well with an initial production of 1,000 barrels a day. The well is in the El Plan field in the State of Vera Cruz.

LANARK COUNTY COUNCIL have approved an application by Imperial Chemical Industries, Ltd., for a water supply for the new ammonia plant at Mossend, Lanarkshire.

EMPLOYEES OF J. GODDARD AND SON, LTD., manufacturing chemists, Leicester, attended a farewell supper on January 7, to Mr. G. H. Viccars, who has retired after 60 years' service with the firm.

THE WEST INDIES SUGAR CO., LTD., in which Tate and Lyle is a majority shareholder, has purchased the Monymusk factory in Jamaica. The West Indies Company purchased the factory for approximately £350,000 in cash from the United Fruit Co. of America.

TORQUAY CORPORATION INVITES TENDERS for the supply, during the year beginning April 1, of safety fuse and explosives, disinfectants, Portland cement, petrol, paint, varnish, glass, soap, oils, etc. Tenders must reach the Town Clerk not later than February 4.

GLASGOW MAGISTRATES HAVE GRANTED 124 applications for traders wanting to be registered for the sale of methylated spirits. The Methylated Spirits Act, which came into force on New Year's day, makes it compulsory for all sellers to keep a register of sales.

THE D'ARCY EXPLORATION CO.—an Anglo-Iranian Oil subsidiary—have commenced to survey 500 square miles of North Lincolnshire in its quest for oil. The survey will cover an area extending north from Brigg as far as Scunthorpe and as far south as Market Rasen.

THE INDUSTRIAL ALCOHOL PLANT at Labbadish, Ireland, is now in production, and the Irish American Oil Co. have been appointed distributors. The factory is under the management of Mr. F. J. Riley, M.Sc. The total capacity for output is one thousand gallons per day.

VALUABLE DEPOSITS OF BARYTES, fluorspar and lead, in Upper Teesdale and Weardale, Durham, are discussed in a report prepared by Professor Granville Poole, professor of mining at King's College, Newcastle, published last week by the Technical Advisory Committee of the North-East Development Board.

THE PRIME MINISTER HAS CONSENTED to be principal guest and speaker at the banquet to be given by the Government at the Mansion House, by the courtesy of the Lord Mayor, on February 21, to mark the opening of the British Industries Fair. The President of the Board of Trade, Mr. Oliver Stanley, will preside.

AN ARRANGEMENT HAS BEEN CONCLUDED between Stockton Chemical Engineers and Riley Boilers, Ltd., and Niven, Nelson and Matthews, Ltd., by which the first named company has taken over Mr. W. J. Niven's patents relating to thimble tube boilers, which boilers have hitherto been marketed under the name of "Nelvin."

OUR ATTENTION HAS BEEN CALLED to a few errors in the list of proprietary and trade names on pages 30-32 of THE CHEMICAL AGE Year Book, 1938. Acriflavine: For "B.30" read "B.10" (Boots Pure Drug Co., Ltd.). Bisoxyl: For "B.10" read "B.20" (British Drug Houses, Ltd.). Stabilarsan, Stabismol, and Sulphostab: For "B.9" read "B.10" (Boots Pure Drug Co., Ltd.).

THE RUBBER GROWERS' ASSOCIATION has arranged for the erection of a rubber pavilion at the Empire Exhibition, Glasgow. It is proposed to stage an exhibit which will illustrate the story of rubber from the growth of the rubber tree to the actual applications of the product in various branches of industry, transport and sport by means of working machinery and models, glass transparencies, coloured illustrations and specimens. Demonstrations will be given at periodic intervals on the production of rubber articles, which will be distributed at the Exhibition.

THE FOOD GROUP of the Society of Chemical Industry has formed a Microbiological Panel with a view to holding meetings for the study of the general subject of industrial microbiology. Professor H. Raistrick has been elected chairman of the Panel and Dr. J. H. Bushill, honorary secretary. Anyone interested in any microbiological problem in industry will be welcomed as a member of the Panel, but if not already a member, would have to join the Society of Chemical Industry. It is intended that the scope of the Panel will include (a) all food industries; (b) those industries utilising micro-organisms, e.g., agriculture, dairying, leather, fermentation industries, etc.; (c) those industries interested in the prevention of the growth of micro-organisms, e.g., in the microbiological spoilage of any raw or manufactured materials.

IMPERIAL CHEMICAL INDUSTRIES, LTD., have placed contracts amounting to many thousands of pounds in connection with their new works at Mossend, Lanarkshire.

AMONG FURTHER NEW YEAR GREETINGS received by THE CHEMICAL AGE, a calendar from the Clayton Aniline Co., Ltd., calls for special mention. It is reproduced from an oil painting by Marcus Stone, R.A., and shows King Henry VIII presenting a bouquet to Anne Boleyn.

FOR THE FIFTH SUCCESSIVE YEAR employees of Zan, Ltd., Wheelock, Sandbach, Cheshire, have received an extra week's wages for satisfactory work during the year. The employees concerned include those of the associated companies, Hopol Engineering Co., and Bone Chemical Co.

THE FAMOUS DISTILLERY AT CAMBUS, Clackmannanshire, which was in existence over a century ago, was reopened last week after having been derelict for 23 years following a disastrous fire in 1914. When working at full capacity it will produce between 50,000 and 60,000 gallons of whisky per week for the Distillers Co., Ltd., and will employ 200 men.

LEVER BROS. AND UNILEVER, LTD., has acquired control of two margarine companies in Newfoundland with a view to developing margarine business in that country. The two companies are Harvey Brehm, Ltd., and the Newfoundland Butter Co., Ltd. They are the only margarine manufacturers in Newfoundland.

THE BRITISH EMPIRE HAS TAKEN the largest area of any foreign nation which is to be represented at the New York World's Fair, 1939. The British Empire has contracted for 140,000 sq. ft. Australia and New Zealand will have independent exhibits in the British Empire section, as will also several of the colonies.

THE NEWCASTLE CITY COUNCIL have agreed to receive a deputation at the next meeting from the newly constituted King's College, Newcastle, after the presentation of a financial statement by Lord Ridley, chairman of the college council, and Lord Eustace Percy, the rector, requesting a larger grant to meet the college's increased expenditure, estimated at £11,000 a year. The college began with a net deficit on the combined accounts for the year 1936-37 of £4,370, and its estimates indicated an annual deficit for 1937-38 and subsequent years of not less than £11,000.

ACCORDING TO THE annual report issued by the Reich Kredit Gesellschaft, the German State-owned bank, the failure of consumer goods production to keep pace with the rise in industrial output is one of the most remarkable features of the national balance-sheet. Recovery is confined to an unusual extent to the production and capital goods industry, particularly the steel, machine, building, motor and shipping industries. A remarkable expansion has taken place in the production of synthetic textiles. Production of staple fibre increased by more than 100 per cent. to some 100,000 tons, and that of artificial silk rose slightly to 55,000 tons.

ARRANGEMENTS HAVE BEEN COMPLETED under which, from January 1, the distribution of Cuprinol products made by Cuprinol, Ltd., of Great Westminster House, 27 Horseferry Road, London, S.W.1, will be controlled by Jenson and Nicholson, Ltd., Carpenter's Road, Stratford, E.15. The manufacture of Cuprinol wood and fabric preservatives, however, will be continued by Cuprinol, Ltd., at their works at Avonmouth. The company is controlled by the National Smelting Co., Ltd., and is a member of the Imperial Smelting Corporation group. Mr. S. G. Barnett, who has been sales manager of Cuprinol, Ltd., and his staff will control the Cuprinol department of Jenson and Nicholson, Ltd., at Stratford.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

South Africa.—The General Stores Department of the City of Durban is calling for tenders (Contract Inquiry No. W.323) for the supply and delivery C.I.F. Port Natal of 400 tons of sulphate of alumina (hydrated) 17-18 per cent., to be packed in casks. Tenders, on the official form, should be received by the Town Clerk, Durban, Natal, South Africa, not later than February 25.

France.—An agent established at Paris wishes to obtain the representation of United Kingdom manuacturers of colours for glass and ceramics. (Ref. No. 23.)

Egypt.—The Commercial Counsellor to H.M. Embassy in Egypt reports that the Egyptian Ministry of Agriculture is calling for tenders, to be presented in Egypt by February 8, 1938, for the supply of chemicals (ground sulphur), zinc phosphide, barium fluosicilate, carbon bisulphide). (Ref. T.Y. 32281/37.)

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2 at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF LUBRICATING-OILS.—Standard Oil Development Co. (United States, Jan. 19.) 35502.

MANUFACTURE OF TITANIUM PIGMENTS.—Titan Co., Inc. (United States, Dec. 24, '36.) 35547.

ALUMINIUM-BASE BEARING METAL ALLOY.—Vereinigte Deutsche Metallwerke, A.-G. (Germany, Dec. 16, '36); (Germany, Sept. 18); (Germany, Oct. 30.) 34914, 34915, 34916.

MANUFACTURE OF SULPHURIC ACID DERIVATIVES OF IMIDAZOLINES.—E. Waldmann. (Austria, Dec. 18, '36.) 35208.

MANUFACTURE OF OPACIFIERS.—J. C. Arnold (Harshaw Chemical Co.). 127.

PROCESS, ETC., FOR RECONDITIONING SOLVENTS.—L. H. Bergman. (France, Feb. 8, '37.) 155; (France, May 25, '37.) 156; (France, Sept. 20, '37.) 157.

PRODUCTION OF RUBBER, ETC., FROM LATEX.—W. Binns. 361.

PRODUCTION OF CELLULOSE FILMS, ETC.—Cellulose Patents (International), Ltd., and E. Bleibler. (Holland, Jan. 4, '37.) 198.

MANUFACTURE OF PERSULPHURIC ACID, ETC.—R. C. Cooper, O. H. Walter and Imperial Chemical Industries, Ltd. 167.

PRODUCTION OF AMMONIUM NITRATE, ETC.—De Directie van de Staatsmijnen in Limburg. (Holland, Jan. 6, '37.) 338.

OXIDATION OF SUBSTITUTED AROMATIC HYDROCARBONS.—Distillers Co., Ltd., and P. Eaglesfield. 30.

MANUFACTURE OF UNSATURATED ACIDS.—Distillers Co., Ltd., and H. P. Staudinger. 31.

MANUFACTURE OF ESTERS.—Distillers Co., Ltd., and H. P. Staudinger. 32.

PURIFICATION OF CARBON, ETC.—Dow Chemical Co. (United States, Aug. 27, '37.) 146.

MANUFACTURE OF BITUMINOUS CEMENTS.—D. Frunzetti. (Roumania, Feb. 1, '37.) 284.

PRODUCTION OF SHAPED ARTICLES from polyvinyl chloride.—W. W. Groves (I. G. Farbenindustrie.) 210.

MANUFACTURE OF FORMALDEHYDE CONDENSATION PRODUCTS containing halogen.—W. W. Groves (I. G. Farbenindustrie.) 211.

MANUFACTURE OF TRIARYL METHANE SERIES DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) 312.

MANUFACTURE OF CONDENSATION PRODUCTS of sulphonic acid amides.—W. W. Groves (I. G. Farbenindustrie.) 313.

MANUFACTURE OF KETONES of the cyclopentanohydrophenanthrene series.—W. W. Groves (I. G. Farbenindustrie.) 318.

PROCESS FOR THE RECOVERY OF AROMATIC HYDROCARBONS from mixtures of aliphatic, etc., hydrocarbons.—J. Haltermann. (Germany, Jan. 30, '37.) 144.

REMOVAL OF GASEOUS WEAK ACIDS and ammonia from gases.—G. W. Johnson (I. G. Farbenindustrie.) 135.

MANUFACTURE, ETC., OF SALTS of chlorsulphonic acid.—G. W. Johnson (I. G. Farbenindustrie.) 136.

SEPARATION OF OILS from mixtures of the same with solid substances.—G. W. Johnson (I. G. Farbenindustrie.) 137.

PRODUCTION OF ALKALINE EARTH METALS.—Magnesium Elektron, Ltd. (Germany, Jan. 7, '37.) 140.

MANUFACTURE OF COMPRESSED CARBON DIOXIDE SNOW BLOCKS.—Maschinenfabrik Esslingen. (Germany, Jan. 9, '37.) 307.

PRODUCTION OF DRYING OILS.—Naamlooze Vennootschap Industrieele Maatschappij voorheen Noury and Van Der Lande. (Holland, Jan. 6, '37.) 52.

PRODUCTION OF HALOGENATED ACID HALIDES.—Naamlooze Vennootschap Organon. 141.

PRODUCTION OF MOULDED CERAMIC BODIES.—J. Pintsch Kommanditges. (Germany, Jan. 4, '37.) 258; (Germany, April 5, '37.) 259.

PRODUCTION OF HYDROCARBON MOTOR FUEL.—Process Management Co., Inc. (United States, Jan. 6, '37.) 346; (United States, Oct. 30, '37.) 347.

MANUFACTURE OF CONDENSATION PRODUCTS from phenols.—R. J. W. Reynolds, E. E. Walker, and Imperial Chemical Industries, Ltd. 165, 166.

PROCESS FOR INHIBITING THE OXIDATION OF OILS, ETC.—T. Sabalitschka, and E. Böhm. (Germany, June 23, '37.) 229.

MANUFACTURE OF AMINO-ALKYLESTERS of carbocyclic acids, etc. T. Sabalitschka, and E. Böhm. (Germany, June 22, '37.) 230.

MANUFACTURE OF PLASTIC DISPERSIONS.—H. Schou. 244.

MANUFACTURE OF CONDENSATION PRODUCTS.—Soc. of Chemical Industry in Basle. (Switzerland, Jan. 9, '37.) 316; (Switzerland, Dec. 6, '37.) 317.

MANUFACTURE OF MOTOR FUELS.—Standard Oil Development Co. (United States, Feb. 6, '37.) 19.

MANUFACTURE OF FUEL OILS.—Stanadrd Oil Development Co. (United States, Jan. 30, '37.) 128.

MANUFACTURE OF ORGANIC PHOSPHATES.—W. J. Tennant (Dow Chemical Co.). 17.

POLYMERISATION OF VINYLIDENE CHLORIDE.—W. J. Tennant (Dow Chemical Co.). 18.

MANUFACTURE OF FILTERS.—A. H. Stevens (Wells). 29.

MANUFACTURE OF PLASTICISED POLYMERIC PRODUCTS.—W. J. Tennant (Dow Chemical Co.). 147.

MEDICINALS.—W. Wyler, and Imperial Chemical Industries, Ltd. 356.

PREPARATION OF HIGHLY ACTIVE OESTROGENIC SUBSTANCES.—B. Zonekd, and E. Bergmann. 271.

PREPARATION OF RESINOUS COATING-COMPOSITIONS.—D. G. Anderson, and R. L. Yeates. 35841.

COLOURATION OF CELLULOSE ESTER TEXTILES.—C. S. Bedford, J. G. Bedford, and R. C. Storey. 36184.

SEPARATION, ETC., OF KETONES of the sterol series.—C. F. Bochringer and Soehne, Ges. (Germany, Dec. 28, '36.) 35924; (Germany, April 7.) 35925.

WATERPROOF COATING COMPOSITIONS.—Callender's Cable and Construction Co., Ltd., and S. Beckinsale. 35657.

MANUFACTURE OF ANTHRAQUINONE DYESTUFFS, ETC.—Chemical Works, formerly Sandoz. (Germany, Dec. 30, '36.) 35639.

PRODUCTION OF CAOUTCHOUC ARTICLES.—J. A. Chemische Fabrik Benckiser-Ges. (Germany, Dec. 24, '36.) 35785.

AROMATIC COMPOUNDS of therapeutic value.—R. L. Despois, and R. Mayer. 35974.

DEPOLYMERISATION OF BITUMINOUS SUBSTANCES.—F. Krupp, A.-G. June 23, 1936. 17510/37.

Complete Specifications Open to Public Inspection

RECOVERY OF PHENOLS.—Bakelite, Ltd. June 30, 1936. (Cognate Application, 714/37.) 713/37.

MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. July 2, 1936. 14859/37.

CHROME-MAGNESIA REFRACTORY and method.—R. P. Heuer. June 29, 1936. 16881/37.

DISAZO DYESTUFFS and their preparation.—Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reuines Etablissements Kuhlmann. June 30, 1936. (Cognate Application, 16959/37.) 16958/37.

PROCESS FOR THE CATALYTIC CONVERSION OF OXIDES OF CARBON into higher hydrocarbons by means of hydrogen.—Ruhrchemie, A.-G. July 3, 1936. 17027/37.

TREATMENT OF CELLULOSE ESTERS.—Kodak, Ltd. July 3, 1936. 17109/37.

MANUFACTURE OF NITROGEN CHLORIDE and products containing nitrogen chloride.—Naamlooze Vennootschap Industrieele Maatschappij Voorheen Noury and Van Der Lande. June 30, 1936. 17380/37.

2-HYDROXYMETHYL-1, 3-DIOXOLANE.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 17426/37.

PROCESS FOR THE PRODUCTION OF 2-*p*-DIOXANONE.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 17427/37.

PROCESS FOR MAKING PLASTIC COMPOSITIONS.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 17428/37.

METHOD OF AND APPARATUS FOR COMMINUTING AND EXTRACTING MATERIALS, in particular oil seeds.—Fauth Patent, A.-G. July 2, 1936. 17463/37.

PLASTIC COMPOSITION.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 17538/37.

LOW-TEMPERATURE DISTILLATION OF FUELS.—Soc. Chimique De La Grande Paroisse Azote et Produits Chimiques. June 30, 1936. 17632/37.

DISTILLATION OF LIQUIDS.—J. Loumiet et Lavigne. June 29, 1936. 17635/37.

MANUFACTURE OF ALIPHATIC ALDEHYDES.—Kodak, Ltd. July 3, 1936. 17822/37.

OBTAINMENT OF ALUMINIUM of large reactive surface.—E. Radiowerk Schrack, A.-G. July 1, 1936. 18186/37.

RESINOUS COMPOSITIONS.—British Thomson-Houston Co., Ltd. July 1, 1936. 18191/37.

PROCESS AND APPARATUS FOR THE GASIFICATION OF FUELS having contents of tar, like e.g. brown coal, lignite, peat, or the like, as well as of thickly-fluid liquid fuels.—D. Mauthner. July 2, 1936. 18464/37.

PROCESSES FOR DIRECT NICKEL-PLATING OF ALUMINIUM and its alloys.—J. Frasch. July 2, 1936. 18485/37.

MANUFACTURE OF CONDENSATION PRODUCTS containing nitrogen. I. G. Farbenindustrie. July 3, 1936. 18545/37.

MANUFACTURE OF GLUCOSIDES having an action on the heart.—I. G. Farbenindustrie. July 3, 1936. 18640/37.

PROCESS FOR THE RECOVERY OF SULPHUR DIOXIDE from gases containing same.—Metallges, A.-G. June 23, 1936. 12985/37.

METHOD OF PREPARING HYDROCARBONS soluble in sulphuric acid. F. Rostler, and V. Mehner. June 26, 1936. 13268/37.

PROCESS FOR OBTAINING VALUABLE POLYMERS from hydrocarbon gases.—Standard Oil Development Co., and I. G. Farbenindustrie. June 27, 1936. 14163/37.

PRODUCTION OF SILICON IRON.—Heraeus-Vacuumschmelze, A.-G. June 27, 1936. (Cognate Application, 14748/37.) 14747/37.

STEELS.—Electro Metallurgical Co. June 24, 1936. 15935/37.

PROCESS FOR THE CONCENTRATION and treatment of chromium ores.—G. F. Alexander. June 25, 1936. 15740/37.

PROCESS FOR THE MANUFACTURE OF ISOBUTENE or derivatives thereof.—Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij. June 27, 1936. 15756/37.

PROCESS FOR PRODUCING ALUMINIUM CHLORIDE.—Ruhrchemie, A.-G. June 22, 1936. 16350/37.

CHEMICAL MANUFACTURE.—Mathieson Alkali Works. June 25, 1936. 16551-2/37.

PROCESS FOR THE PRODUCTION AND RECOVERY OF MOLYBDENUM. International Hydrogenation Patents Co., Ltd. June 27, 1936. 16535/37.

MEANS FOR PURIFYING WATER.—Wallace and Tiernan Products, Inc. June 27, 1936. 16611/37.

PROCESS FOR COLOURING TEXTILES.—Soc. of Chemical Industry in Basle. June 25, 1936. 16872/37.

PROCESS FOR THE PRODUCTION OF A STABLE, WATER-SOLUBLE MEDICAMENT from the latex of lactuco virosa.—Knoll, A.-G., Chemische Fabriken. June 23, 1936. 17256/37.

MANUFACTURE OF AROMATIC COMPOUNDS alkylated in the nucleus.—I. G. Farbenindustrie. June 23, 1936. 17349/37.

REFINING OF HYDROCARBON OILS.—Edeleanu Ges. June 23, 1936. 17350/37.

PROCESS FOR THE MANUFACTURE OF ACIDS of the cyclopentanopolyhydrophenanthrene series and their derivatives.—Schering-Kahlbaum, A.-G. June 22, 1936. 17366/37.

OBTAINMENT OF A GAS comparatively rich in krypton.—Naamlooze Vennootschap Philips' Gloeilampenfabrieken. June 25, 1936. 17377/37.

PRODUCTION OF HYDROGEN PEROXIDE.—Mathieson Alkali Works. June 25, 1936. 17464/37.

RUBBER COMPOSITIONS.—United States Rubber Products, Inc. June 24, 1936. 17466/37.

EXTRACTION OF VANADIUM from vanadium-bearing material.—Vanadium Corporation of America. June 27, 1936. 17468/37.

ELECTRO-THERMAL DECOMPOSITION OF CARBONACEOUS LIQUIDS.—E. I. du Pont de Nemours and Co. (United States, Dec. 31, '36.) 36294.

Specifications Accepted with Date of Application

ELECTROLYTIC REFINING OF CHROMIUM AND FERRO-CHROMIUM and the production of chromic acid.—E. Liebreich. March 21, 1935. 477,381.

MAKING ALKALI SUBSILICATES.—Pennsylvania Salt Manufacturing Co. April 10, 1935. 477,518.

MANUFACTURE OF CELLULOSE DERIVATIVE COMPOSITIONS.—Distillers Co., Ltd., H. A. Auden, and H. P. Staudinger. May 18, 1936. 477,327.

TREATMENT OF TEXTILE YARNS OR threads with rubber.—J. H. Fenner and Co., Ltd., J. H. Fenner, S. B. Staudinger. May 18, J. H. Anderson. May 22, 1936. 477,393.

MANUFACTURE OF ENOL DERIVATIVES containing the sterol nucleus.—A. G. Bloxam (Soc. of Chemical Industry in Basle.) May 29, 1936. 477,400.

ELECTRODEPOSITION OF TANTALUM and tantalum alloys.—H. H. Armstrong, and A. B. Menefee. June 24, 1935. 477,519.

PRODUCTION OF BOTTLE CAPS and the like from cellulose esters. Distillers Co., Ltd., H. A. Auden and H. P. Staudinger. June 25, 1936. (Addition to 456,973.) 477,402, 477,403.

DETERGENTS.—Colgate-Palmolive-Peet Co. June 27, 1935. 477,521.

PURIFICATION OF IMPURE NOBLE METALS.—Distillers Co., Ltd., and H. Langwell. June 26, 1936. 477,522.

POLYMERISATION OF ORGANIC LIQUIDS.—Du Pont Viscoloid Co. June 26, 1935. 477,364.

PYROMETERS.—W. J. Clark, and Imperial Chemical Industries, Ltd. June 26, 1936. 477,365.

RUBBER PROCESSES and products.—T. L. Shepherd. June 27, 1936. 477,523.

PRODUCTION OF SYNTHETIC RESINS and the manufacture of films or sheets therefrom.—Kodak, Ltd. June 18, 1936. 477,446.

SOLUBLE CHLORINE containing butadiene derivatives.—Marbon Corporation. July 9, 1935. 477,447.

METALLIC PIGMENT PASTES.—Metals Disintegrating Co., Inc. May 16, 1936. 477,451.

ADSORPTIVE REAGENT for the removal of odorous and otherwise objectionable gases and vapours from atmospheres, and the product of such process.—Hygienic Research Proprietary, Ltd. Aug. 17, 1935. 477,461.

PROCESS OF PREPARING NITRILES.—Armour and Co. Dec. 9, 1935. 477,463.

PRODUCTION OF RESIN-LIKE PRODUCTS.—R. Weithoner, and M. Glasuritwerke M. Winkelmann Ges. June 30, 1936. 477,415.

PROCESS OF, AND APPARATUS FOR, the preparation of solid carbon dioxide in agglomerated form.—W. Hessling. June 30, 1936. 477,587.

PROCESS FOR THE MANUFACTURE OF "DRY ICE."—W. Hessling. July 1, 1936. 477,464.

MANUFACTURE OF ARTIFICIAL MATERIALS from halogenated hydrocarbons.—I. G. Farbenindustrie. July 17, 1935. 477,532.

PROCESS FOR THE MANUFACTURE of dialkylaminophosphorus fluorides.—I. G. Farbenindustrie. July 2, 1935. 477,534.

ANTHRAQUINONE DERIVATIVES.—F. Lodge, and Imperial Chemical Industries, Ltd. July 1, 1936. 477,535.

MANUFACTURE OF WATER-SOLUBLE SALTS of acid-esters of the cardiac glucosides.—I. G. Farbenindustrie. July 3, 1935. (Samples furnished.) 477,547.

PICKLING METAL, particularly ferrous metal.—Timken Roller Bearing Co. Sept. 3, 1935. 477,425.

PRODUCTION OF STABLE COLOURED PIGMENTS having zirconium dioxide as a basis.—L. Passerini. Sept. 3, 1935. 477,426.

APPARATUS FOR THE DISTILLATION OF SCHISTS, shales and other solid materials.—Soc. Generale De Fours A Coke, Systemes Lecocq Soc. Anon. Jan. 3, 1936. 477,491.

PRODUCTION OF LEAD ARSENATE.—Montecatini, Soc. Generale Per L'Industria Mineraria Ed Agricola. Feb. 1, 1936. 477,431.

GAS-PURIFYING MATERIAL.—Compagnie Des Produits Chimiques Et Charbons Actifs E. Urbain. Aug. 29, 1936. 477,494.

MANUFACTURE AND PRODUCTION OF WETTING, cleansing, dispersing agents, solvents, and the like.—I. G. Farbenindustrie. Feb. 29, 1936. 477,499.

MAKING ALKALI SUB-SILICATES.—Pennsylvania Salt Manufacturing Co. April 10, 1935. 477,578.

Chemical and Allied Stocks and Shares

BETTER conditions have developed in the stock and share markets this week. This is a reflection of the trend of Wall Street and of rather more hopeful views as to the general trade position in the United States, which has stimulated some improvement in prices of metals and commodities.

In sympathy with the better general market conditions shares of chemical and kindred companies came in for more attention. Best prices were not held, but in some cases sharp gains have been established on balance for the week. Boots Pure Drug, for instance, are 47s. 7½d., compared with 45s. 6d. a week ago. United Molasses have risen 1s. to 26s. 1½d. aided by the higher tanker freight rates, while Lever Brothers' ordinary were higher at 36s. 3d. on the hope that the dividend may be raised to around 7½ per cent. Triplex Safety Glass gained 1s. 3d. to 52s. 6d.

Imperial Chemical remained rather dull, and at 34s. 6d. are 3d. lower on the week, the market being less inclined to look for a larger dividend than 8 per cent., because it is felt the directors may be influenced in their decision as much by views of the outlook for international trade as by the results for the past year. Many market men anticipate, however, that the latter are likely to show a further good rise in profits, in which case earnings on the larger amount of ordinary capital now in issue would exceed the 12 per cent. shown for 1936. It will be recalled that the capital was increased last year in connection with the acquisition of the Salt Union.

Distillers at 107s. show a gain of 1s. on the week. As was expected, the interim is to be maintained at 7½ per cent., and all question of an increase left until the final dividend. General Refractories remained at the lower price of 19s. 6d. made in the previous week, but International Diatomite were better on the increase in the interim dividend. Imperial Smelting, as usual, tended to move with the price of zinc, and at 13s. 6d. are moderately better on the week. British Oxygen at 83s. 3d., and Murex at 90s. are above the prices current a week ago.

British Match were steady at 35s. Swedish Match were active at 24s. 6d. partly owing to talk of the possibility of a resumption of dividends this year, although this is not generally expected in the market. Hopes of a larger dividend again maintained a fair amount of interest in British Aluminium, which are 6d. better at 46s. 6d. Pinchin Johnson are 37s. 6d., compared with 37s. 9d. a week ago, but International Paint at 70s. have gained a few pence. Courtaulds at 47s. have not held best prices as it is not generally expected there is likely to be more than a fractional increase in the past year's dividend. The disposition is to look for a final of 7 per cent., which with the interim of 3½ per cent., would make a total of 10½ per cent. Borax Consolidated at 27s. 3d. were fairly steady.

Iron, steel and kindred shares were fairly steady with chief attention tending to be given to Consett Iron, Pease and Partners, and Stewarts and Lloyds on the possibility of larger dividends. The market is hopeful the payment of the last-named company may be raised from 7½ per cent. to 9 per cent. United Steel ordinary were steady; the interim dividend is expected to be declared in February and it is generally believed it will be maintained at 2½ per cent.

Oil shares have been more active, but best prices were not held. As fears of lower oil prices have been dispelled in the market the disposition is to take a favourable view of the dividend prospects of the leading companies.

Weekly Prices of British Chemical Products

A LITTLE more activity has been noticeable in the chemical markets during the past week, and in some directions the volume of business is reported to be better than for the same period a year ago. Buyers appear to be calling up their contract commitments with unusual promptness and the general movement in heavy chemicals has already reached fair dimensions. There are no price alterations of any importance to record for general chemicals rubber chemicals and wood distillation products and quotations for most items are steady with a firm undertone. Trade in coal tar products is reported to be a little brighter although the volume of actual buying remains on a very moderate scale. Prices remain at recent levels, but a firm undertone prevails throughout the market. In some quarters it is felt that values for most of the light hydrocarbons have already touched bottom.

MANCHESTER.—Conditions on the Manchester chemical market during the past week have been pretty well back to normal in most sections after the seasonal slackness. A moderate volume of fresh business in the heavy products has been reported, mainly for prompt and near delivery positions, and the movement of supplies against contracts has, on the whole, been on a fair scale. Bleaching and finishing chemicals have not been quite so good as they were a month or so ago, but the demand for the paper-making and other leading outlets have been reasonably satisfactory. The price position generally is steady, and so far as the lead, copper and zinc products are concerned, the undertone has improved in sympathy with the firmness of the metals. Fresh buying of tar products has continued quiet in most directions.

GLASGOW.—Business in general chemicals still remains rather quiet, both for home trade and export. Prices, however, continue very firm on basis of previous figures, with no further changes to report.

Price Changes

Rises: Copper Sulphate (Manchester); Sodium Sulphite, pea crystals, spot.

Falls: Lead Acetate, white and brown (Manchester); Lead, red (Scotland); Carbolic Acid, crystals; (Manchester); Cresylic Acid, 99/100%; Naphthalene, purified crystals; Xylol, commercial and pure; Sulphate of Copper (Scotland).

General Chemicals

ACETONE.—**£45 to £47 per ton.**

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 2s. 6d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £19 per ton, ex wharf.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £17 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £11 10s. per ton.

BLEACHING POWDER.—Spot, 35/37%, £8 15s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d. station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9½d. per lb., less 2½%; d/d U.K.

CHROMIUM OXIDE.—11d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0½d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£21 7s. 6d. per ton, less 2% in casks. MANCHESTER: £19 per ton f.o.b. SCOTLAND: £19 15s. per ton, less 5%, Liverpool, in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £4 17s. 6d. to £5 17s. 6d. per cwt. according to quantity; in drums, £4 10s. 6d. to £5 3s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 4d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots) Dark, 50% by volume, £21 10s.; by weight, £27 10s.; Pale, 50% by volume, £27; by weight, £32 per ton. LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £31 10s.; brown, £1 per ton less. MANCHESTER: White, £34; brown, £33.

LEAD NITRATE.—£34 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £31 per ton, less 2¼% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £32 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £17 to £30 per ton according to strength and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £54 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

POTASH CAUSTIC.—Solid, £35 5s. to £36 15s. per ton for 2-ton lots ex store; broken, £42 per ton. MANCHESTER: £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 10s. per ton.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 5s. 6d per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 10¾d. to 1s.

POTASSIUM PRUSSIATE.—6¼d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6¼d.

SALAMMONIAC.—Dog-tooth crystals, £36 per ton, fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 to £3 10s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £12 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £17 15s. per ton net ex store.
SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 10s.
SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.
SODIUM CARBONATE MONOHYDRATE.—£15 5s. per ton d/d in minimum ton lots in 2 cwt. free bags
SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.
SODIUM CHROMATE.—4¼d. per lb. d/d U.K.
SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. MANCHESTER: 4d. per lb. GLASGOW: 4¼d. net, carriage paid.
SODIUM HYPOSULPHITE.—Pea crystals, £14 10s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. 0d. per cwt. in 1-cwt. kegs, net, ex store.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, 9¼d. per lb. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £15 to £16 per ton delivered per ton lots.
SODIUM PRUSSIATE.—d. per lb. for ton lots. GLASGOW: 5d. to 5¾d. ex store. MANCHESTER: 4¼d. to 5d.
SODIUM SILICATE.—£9 10s. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
SODIUM SULPHITE.—Pea crystals, spot, £15 per ton d/d station in kegs.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1¼d. per lb. GLASGOW: 1s. 1d. per lb., 5%, ex store.
WHITE SUGAR OF LEAD.—£31 10s. per ton net.
ZINC SULPHATE.—Tech., £12 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £6 10s. per ton, according to quality.
CADMIUM SULPHIDE.—7s. 3d. to 7s. 6d. per lb.
CARBON BLACK.—4⅜d. per lb., ex store.
CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 10½d. to 11d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4¾d. to 5½d. per lb.; dark 4d. to 4½d. per lb.
LAMP BLACK.—£28 to £30 per ton del., according to quantity. Vegetable black, £35 per ton upwards.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—30%, £16 10s. to £17 5s. per ton.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.
ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1938: November, £7 8s.; December, £7 9s. 6d.; January, 1938, £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1938: November, £7 10s.; December, £7 11s. 3d.; January, 1938, £7 12s. 6d.; February, £7 13s. 9d.; March, £7 15s.; April/June, £7 16s. 3d.
NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1938.
SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1938.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 8d. to 1s 8½d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d.
CARBOLIC ACID.—Crystals, 7½d. to 8½d. per lb., small quantities would be dearer; Crude, 60's, 4s. to 4s. 3d., dehydrated, 4s. 6d. to 4s. 9d. per gal. MANCHESTER: Crystals, 9d. per lb. f.o.b. in drums; crude, 4s. per gal. GLASGOW: Crude, 60's, 4s. 3d. to 4s. 6d. per gal.; distilled, 60's.
CREOSOTE.—Home trade, 6¼d. to 6⅝d. per gal., f.o.r. makers' works; exports, 6⅝d. to 6¾d. per gal., according to grade. MANCHESTER: 5½d. to 6½d. GLASGOW: B.S.I. Specification, 6d. to 6¼d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6¼d.
CRESYLIC ACID.—97/99%, 4s. to 4s. 3d.; 99/100%, 4s. to 5s. 6d. per gal., according to specification; Pale, 99/100%, 4s. 4d. to 4s. 7d.; Dark, 95%, 3s. 8d. to 3s. 11d. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 4s. 3d. to 4s. 6d. MANCHESTER: Pale, 99/100%, 4s. to 4s. 3d.
NAPHTHA.—Solvent, 90/160, 1s. 6½d. to 1s. 7½d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.
NAPHTHALENE.—Crude, whizzed or hot pressed, £7 10s. to £8 10s. per ton; purified crystals, £16 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 10s. to £7 per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £17 10s. per ton f.o.b.
PITCH.—Medium, soft, 36s. to 38s. per ton, f.o.b. MANCHESTER: 33s. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.
PYRIDINE.—90/140%, 12s. to 14s. 9d. per gal.; 90/160%, 11s. to 12s. 6d. per gal.; 90/180%, 3s. 3d. to 3s. 6d. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 12s. 6d. to 14s. per gal.
TOLUOL.—90%, 1s. 10½d. per gal.; pure, 2s. 3½d. to 2s. 4½d. GLASGOW: 90% 120, 1s. 10d. to 2s. 1d. per gal.
XYLOL.—Commercial, 2s. 2d. per gal.; pure, 2s. 4d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 15s. to £8 5s. per ton; grey, £10 to £11. Liquor, brown, 30° Tw., 6d. to 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11 10s.
METHYL ACETONE.—40-50%, £40 to £42 per ton.
WOOD CREOSOTE.—Unrefined 6d. to 9d. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.—2s. 8d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.
WOOD TAR.—£2 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZIDINE, HCl.—2s. 5d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL, 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£72 per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 10d.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works
GAMMA ACID.—Spot, 4s. per lb. 100% d/d buyer's works.
H ACID.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
NAPHTHIONIC ACID.—1s. 8d. per lb
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—9¼d. to 9⅝d. per lb.; flake, 9½d. to 9⅞d.
α-NAPHTHYLAMINE.—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. per lb. 100%.
o-NITRANILINE.—3s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. to 10d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb., 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10-cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Satisfactions

JAMES EASTWOOD AND SONS (1936), LTD. (old co.), Leeds, chemical manufacturers. (M.S., 15/1/38.) Satisfaction December 24, of charge registered January 5, 1937.

Bankruptcy Proceedings

(NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court Judgments against him.)

MASON, GEO. WHITWORTH. (R.O., 15/1/38.) Lodging at Ingsfield, White Lee Road, Batley, trading as Mason and Son, Station Mills, Gomersal, soap and chemical manufacturer. Receiving Order, January 8. Adjourned January 8.

Declaration of Solvency Filed

PATENT MEDICINE DRUG AND CHEMISTS SUPPLY CO., LTD. (D.S.F., 15/1/38.) Manchester. December 29.

Companies Winding-up Voluntarily

BRITISH SUGAR MANUFACTURERS. (C.W.U.V., 15/1/38.) Creditors' claims by March 1, to Norman King, the liquidator of the company.

Company News

Petroleum Storage and Finance Corporation, Ltd., in its report for the year to October 31 last, shows that trading profits, after tax and N.D.C., are up from £266,152 to £574,817, and after reducing the depreciation provision from £51,637 to £20,840, net earnings are £339,816 higher at £551,726.

Calmic, Ltd., chemical manufacturers, etc., 71-3 Leeds Street, Liverpool, has increased its nominal capital by the addition of £7,250 beyond the registered capital of £250. The additional capital is divided into 2,250 ordinary and 5,000 5½ per cent. cumulative redeemable preference shares of £1.

Dordtsche Petroleum Industrie Maatschappij (Royal Dutch group) has decided to declare an interim dividend of 7 per cent. (same) on the preference shares and 5½ per cent., against 4 per cent. on the ordinary shares for the financial year 1937. The total distribution for 1936 was 16.6 per cent. (1935: 10.5 per cent.) on the ordinary and preference shares.

International Diatomite Co., have declared an interim dividend of 4 per cent., less tax, payable on January 31, to shareholders registered on January 20. This compares with an interim payment of 2 per cent. paid on account of the initial period of ten months to June 30 last. The final payment was 6 per cent., making 8 per cent., less tax, for the period. The business of the operating subsidiary, Moler Products, Ltd., has been well maintained, and it is expected that its profits for the current year ending March 31 will not be less than those of the previous year.

The Electrolytic Zinc Co. of Australasia announces a dividend of 6 per cent. on the ordinary shares for the six months ended December 31 last. This is the same as for the corresponding period of 1936. A similar dividend is again announced on the 8 per cent. cumulative participating preference shares. For the full year ended June 30 last a final dividend of 9 per cent. and bonus of 2½ per cent. was distributed on both classes of shares, making a total of 17½ per cent. The present dividends are payable at the registered office of the company on March 17 to shareholders registered on January 26.

English Clays, Lovering, Pochin and Co., Ltd., state that record results were achieved in the year to September 30 last. Trading profits advanced by £97,472 to £267,254. The depreciation provision is increased from £22,007 to £31,977, and tax, which this time includes N.D.C., absorbs £53,887, against £18,048. After repeating the transfer to leasehold and mortgage redemption reserve at £15,000, the net earnings are up from £90,735 to £141,676. The dividend on the £2,211,930 ordinary capital is stepped-up by 1½ per cent., to 4½ per cent. The allocation to general reserve is doubled at £20,000, leaving the carry-forward at £31,604, compared with £20,754. A sum of £75,000 is provided out of share premium account to write off steam and other plant rendered obsolete by the recent completion of electrification and reorganisation.

New Companies Registered

Peter Hadfield, Ltd. (334,922.)—Private company. Capital, £350 in 350 shares of £1 each. To carry on the business of consulting, analytical, manufacturing, pharmaceutical and general chemists, etc. Directors: Peter Hudson, Raincliffe Manor, Thoxenby, Scarborough; Mrs. Susannah Hudson; Duncan McCallum.

Essex Water Softeners, Ltd. (335,162).—Private company. Capital, £100 in 100 shares of £1 each. To carry on the business of manufacturers of and dealers in water softening plants, filtration and purification apparatus and appliances of all kinds, drugs, chemicals, etc. Directors: Thomas W. Eley, "Bergholt," Ardleigh Green Road, Hornchurch, Essex; Gordon P. Bailey. Registered office: Essex Works, Chadwell Heath, Essex.

Micro-Lead Products (Ericsson), Ltd. (335,266).—Private company. Capital, £1,000 in 20,000 shares of 1s. each. To carry on the business of manufacturers and producers of red and white lead, lead powder, lead litharge, lead compounds, lead paints, components or compositions of minerals and other matter, whether such manufacture or production is effected by means of "Solutier" patent process or otherwise, etc. Subscribers: Thos. Kirkham, Croslands, Parkside Road, Northwood, Middlesex; John H. Reed.

The Zinc Development Association, Ltd. (335,413).—To promote with a view to increasing the consumption of zinc, co-operation between persons, firms and companies, including those who are or may become members of the Association, and who carry on business as miners, smelters, producers, refiners, manufacturers, rollers, fabricators, or consumers of or dealers in or distributors of, or are otherwise connected with or interested in zinc, zinc alloys, zinc pigments and/or zinc containing materials, etc. Subscribers: F. Huth, Hillwood, West Hill, S.E.26; S. C. Hunn, H. J. Cook, R. A. Weedon, H. V. Cusson, B. Kirkwood, F. V. Thompson, H. S. Whitworth-Jones.

Forthcoming Events

London.

January 17.—University College, Gower Street, W.C.1. 5 p.m. Dr. H. R. Ing, "Chemical Structure and Pharmacological Action."

January 18.—Institution of Chemical Engineers. Joint Meeting with the Institution of Civil Engineers. Great George Street, Westminster. 6 p.m. Dr. A. Parker, "The Treatment and Disposal of Trade Waste Waters."

January 20.—The Chemical Society. Burlington House, Piccadilly, W.1. Ordinary Scientific Meeting. 8 p.m.

Birmingham.

January 19.—Institute of Chemistry. H. W. Brownsdon, "Some Problems of Lubrication."

January 22.—Midland Chemists' Dinner-Dance. Midland Hotel.

Bristol.

January 20.—Society of Chemical Industry. Bristol University, Woodland Road. 5.30 p.m. Dr. R. P. Linstead, "Some Recent Developments in Colour Chemistry."

Glasgow.

January 21.—Society of Chemical Industry. Royal Technical College. Joint Meeting with Oil and Colour Chemists' Association. 7.30 p.m. Professor F. M. Rowe, "Colour Constitution and Properties of Insoluble Azo-Colouring Matter."

Hull.

January 18.—Hull Chemical and Engineering Society. Municipal Technical College, Park Street, 7.45 p.m. F. S. Pilkington, "The Process of Metal Spraying by the Wire Pistol, and some of its Uses."

Leeds.

January 17.—Institute of Chemistry. R. Taylor, "Modern Developments in High Pressure Chemistry."

January 25.—The Chemical Society. New Chemistry Building of the University. Meeting for Reading Papers. 7 p.m.

Liverpool.

January 21.—Society of Chemical Industry. University. 6 p.m. R. Donaldson, "Colour Measurement."

January 26.—Society of Chemical Industry. Joint Meeting with Institution of Petroleum Technologists, Northern Branch. University. 7.30 p.m. Dr. A. E. Dunstan, "A Modern Oilfield and Refinery."

Manchester.

January 22.—British Association of Chemists. Engineers' Club. Conversazione.

Nottingham.

January 17.—Institute of Fuel (East Midlands Section). Joint meeting with Nottingham Society of Engineers. University College. 7 p.m. W. L. Howe, "Modern Application of Gas Heating in Industries."

Widnes.

January 26.—British Association of Chemists. Liverpool Section Meeting. Central Hotel, Widnes. 7.30 p.m.